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# **PRINCIPLES OF ACCOUNTING**



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# PRINCIPLES OF ACCOUNTING

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## PREFACE

THIS book is intended primarily as a text for general accounting courses in colleges and universities. It may also be of interest to other readers than college students who wish to understand the fundamentals of accounting. Although new books are now being rapidly added to the list of general treatises on the subject the authors feel that no apology need be offered for the appearance of this volume. There has been a dearth of material available for the student of economics who desires a broad training in accounting principles as a part of a general equipment. The texts available are, for the most part, too highly professional and specialized for this purpose, and are without adequate reference to the background of economic principles underlying all commercial transactions. In other words, although there are many books intended for the business man and professional accountant there are few works on accounting which even profess to be suited to the needs of the student of economics. It is the aim of this book to present the principles of the subject in such a way as to meet the needs of the general student as well as to afford the proper basis for specialized work in professional accountancy.

An effort has been made to develop principles without discussing the details of *specific* systems of bookkeeping and office methods. This procedure implies that accounting is a science dealing with logical classifications and embracing a definite body of doctrine which can be developed independently of mere clerical routine. Furthermore, since the classroom is not a laboratory capable of reproducing exact business conditions, and since bookkeeping methods are constantly changing, a discussion of clerical details is of minor importance in a treatise on principles. Once a student is thoroughly grounded a mastery of the technical details of any particular system of accounts is easily attained. On the other hand, the important *general*

features of technique have been sufficiently discussed and illustrated to familiarize the student with the fundamental types of books and working papers used in modern practice.

The essential characteristics of modern business organization and finance have received some consideration because of the close relation of these matters to accounting. No attempt has been made, however, to treat these topics elaborately or to refer, for illustration, to specific legal cases. In the first place a too full discussion of such subjects tends to leave the student with a vague impression of the accounting principles involved. In the second place such details as may be desired can be introduced more effectively by means of problems and illustrations from current practice furnished by the instructor. Further, special courses in commercial law, business organization, corporation finance, and similar subjects are generally conceded to be an essential part of the course of study which should be prescribed for the student of economics and accounting. Accordingly, although it should be admitted that the professional accountant requires a rather minute knowledge of these matters, it seems evident that a lengthy study of such topics cannot properly be included in a single course in accounting principles.

Although in the exposition of principles in the main part of the book special systems of accounts are not discussed, it has seemed advisable in Part Six to present a brief statement suggesting some of the essential features of the more important special fields. The topics considered have been chosen particularly because of the fact that in many institutions the advanced courses in accounting deal with these branches of the subject. Part Six, then, serves to give to the student who wishes to pursue special work a glimpse of the more important fields, and also serves to give to the general student some impression of the scope of accounting. No mention is made, however, of the special systems required by banks, insurance companies, commission merchants, brokerage houses, farm enterprises, construction companies, etc. It would be out of the question to include a study of many special systems in a single volume, and in any case it is doubtful if such material is of much value to the student of general accounting.

Certain rather important special features of this book should,

perhaps, be mentioned in the foreword. In the first place it has seemed to the authors that the importance of the *proprietary* interest, so-called, is unduly stressed in most textbooks. Indeed, the usual treatment of the subject is so dominated by the doctrines of proprietorship that it might well be described as "proprietary accounting." Although this theory of accounts is not an unreasonable view for the accountant who is dealing with very simple situations, as applied to the complex conditions of modern business organization it becomes practically untenable. Particularly in view of the present and growing importance of the corporate form of organization, with all its complexities of ownership, is it becoming more difficult to define proprietorship on any but a conventional basis. Accordingly, the significance of the concept of proprietorship *in the theory of accounts* has been minimized in this book (although the accounting importance of this equity has by no means been neglected). The business enterprise in its entirety has been emphasized as the accounting unit of organization, and an attempt has been made to state the theory of accounts in terms of the needs and purposes of all the equities in the enterprise rather than from the standpoint of any particular interest. The adoption of this view has led to certain important consequences in connection with the discussion of interest transactions and other topics.

In the presentation of the theory of valuation this book also diverges somewhat from current treatments of the subject. A logical theory of valuation for accounting purposes has been adopted; and for the sake of completeness and consistency this view has been introduced even in the discussion of the elementary principles of double-entry. It is possible and even advisable, however, for the instructor to postpone the consideration of the more difficult points implicit in this matter until they are specifically taken up later in the text. Further, it should be emphasized that the authors recognize that there are certain practical difficulties in the way of the actual adoption, at all points, of some of the theories presented. It is felt, however, that the student of accounting should be trained in the logical analysis of business situations, and that such training will promote rather than jeopardize his chances for professional success.

The discussion of the interest problem in this volume, partic-



ularly the mathematics of interest, is rather elaborate. It is recognized that the mathematics of interest calculation is a matter somewhat outside the field of accounting proper. Nevertheless the importance of this subject, particularly in connection with certain branches of accounting, can hardly be overemphasized; and there can be no doubt that it should form a part of the regular course of study taken by the accounting student. Moreover in many cases suitable courses in mathematics are not available to supply this need. Even if such special courses are available some review of (or introduction to) this work in connection with a study of accounting principles seems advisable. The instructor, however, who for any reason desires to abbreviate this part of the course may easily do so. Chapter XV is designed to give a general view of the interest problem and might be used, if a short course is desired, without Chapters XVI, XVII, and XVIII. Or Chapter XVI alone might be omitted without seriously impairing the availability of the remaining chapters.

Finally, the terminology employed in this text does not conform to current business and accounting usage at all points. Since this is primarily a book for the student it has seemed legitimate for the sake of clearness to employ some terms which differ from those in common use. Where the expressions used here differ noticeably from current practice, however, the conventional terminology is referred to. An attempt has been made to standardize the nomenclature for all important conceptions. A serious cause of confusion in accounting is the loose terminology commonly employed. To some extent the terms adopted by the Interstate Commerce Commission in its prescribed classifications (which represent the most logical system of accounting phraseology at present developed) have been used.

This book has been planned to suit the needs of the general course in principles as was stated above; and it is believed that it can be used successfully in either one-year or two-year courses. In many institutions a single course (running from three to five hours per week through two semesters) is devoted to the study of principles. In such a course, Part One, supplemented by laboratory work, will furnish sufficient material for the first semester's work. In the second semester the student

is able to handle larger reading assignments in the advanced topics, and the remaining chapters may be conveniently covered. Where a two-year course of from two to three hours per week is given, this text may still be used to advantage if supplemented with considerable practice work in elementary accounting. In any case, of course, practice work is necessary. The authors have prepared a book containing about 500 problems and exercises arranged in chapters specifically to accompany this text.<sup>1</sup> It is probable that many instructors would consider it unnecessary, if using this exercise book, to introduce other laboratory material.

The authors wish, in conclusion, to acknowledge their indebtedness to their instructors and colleagues (former and present) of the University of Michigan who have furnished, in large measure, the background of economics and accounting which has made possible the preparation of this text. Among these should be mentioned, as having had a particularly important influence, Professor H. C. Adams, Professor F. M. Taylor, and Professor David Friday.

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## **INTRODUCTION**



# PRINCIPLES OF ACCOUNTING

## I

### THE NATURE AND SCOPE OF ACCOUNTING

ACCOUNTING, in a broad sense, is the science which attempts to present and classify the statistics of the *properties* and *property rights* in the business enterprise. All valuable considerations coming into the possession of a business concern should be accounted for, and the rights which various individuals and interests have in the business must be protected. To accomplish this, more or less elaborate statistical records are usually necessary.

Since accounting has to do primarily with the private business enterprise, the gaining of a general conception of the *enterprise* as the accounting unit of organization is an essential preliminary step in the study of this subject. In the following section the nature of the business enterprise will accordingly be briefly discussed.

### THE BUSINESS ENTERPRISE

A business enterprise involves the investment of capital funds, often by more than one individual, in some commercial project. Such a venture, supposedly, contemplates the production of some commodity or service which commands a price on the market. The owners of the capital invested in any case naturally expect to realize a gross income from the sales of the product which will not only maintain the original investment but will yield a *net* income as well. It is the function of account-

ing to follow the investment, as it takes shape in various commodities and services, and to inform the investor as to the amount and rate of net income and the subsidiary facts which will enable him to make a rational disposition of his resources.

The familiar types of business organization in the United States are the single-proprietorship, the partnership, and the corporation. The joint stock company, a kind of halfway house between the partnership and the corporation, is no longer common in this country, having been almost entirely superseded by the corporation. A brief statement of the nature of these three common types of business units will be given at this point.

The single-proprietorship is a business enterprise conducted by a single individual. Actual ownership of the property used commonly resides largely in the hands of the proprietor, so-called. The proprietor is usually the active manager of the business and may furnish a considerable part of the ordinary labor services required.

In a strict sense any capitalist, however humble, who is utilizing his resources in an independent commercial venture, is a proprietor, and his business is a single-proprietorship. The majority of retail stores are of this type, many wholesale and manufacturing businesses are single-proprietorships, and farm establishments are almost always in this class. Such enterprises range in importance from the fruit stand on the corner to the private banking house or other large business having an investment of many thousands of dollars. Very large aggregates of capital, however, are seldom brought together under the single-proprietorship form.

Although the single-proprietorship is legally only a kind of personal enterprise, and no formal steps of organization are usually required for its initiation, still it is useful for the accountant to conceive of such a business as a commercial *unit* of organization. The personification of the business enterprise, a figure so much deplored by some writers, is one of the fundamental ideas of accounting, and it may well be applied to all kinds of businesses, the simple as well as the complex. In general this view conforms to commercial and legal practice and no apologies need be made for such a conception. The most important financial statement, the balance sheet, can always be

conveniently conceived as representing the financial condition of a distinct business entity.

Probably the great majority of single-proprietors make but an imperfect use of accounts; but something in the way of statistical records is essential in nearly all such cases, and efficiency in the management of even the small concern would generally be much advanced by an extension of the use of systematic accounting methods. Certainly the accountant should be familiar with the general nature of the single-proprietorship and the accounting problems arising in such cases.

The partnership is an association of two or more persons by contractual agreement in a business undertaking. Partnerships are usually composed of but two, three, or four members, but there may be any number of partners. The partnership association is usually based upon a written agreement called the articles of copartnership. This agreement commonly contains stipulations in regard to investments, withdrawals of principal or income, management, division of income, dissolution, etc.

It is fairly evident that careful accounting is much more important in the case of the partnership than in the case of the single-proprietorship. Where more than one individual or interest is involved in an enterprise questions of equity commonly arise. The failure to keep a careful record of all business transactions in such a case may result in the exploitation of one equity to the advantage of another; and at any rate if the business is of considerable size and complexity the partners will be very much in the dark as to the actual situation. The importance of proper accounting is the more clearly seen when it is noted that the rights of the partners in control, income, investment, etc., may differ widely. The characteristics of the partnership and the peculiarities of partnership accounting will be specifically discussed later in the text.

The corporation is in many respects the most important form of business organization. In point of aggregate capital controlled, number of employees, quantity of output, financial influence, etc., the corporation easily leads in many important lines of industry; and the development of this form of organization does not yet appear to have reached its limit. The corporation is marvelously well adapted to the exigencies of large scale pro-



duction. By this device the capital of the investor, great and small, is brought together and welded into a unit for purposes of carrying on economic production under modern conditions. By means of a great variety of securities the corporation form permits of the division of the important elements of ownership in such a way as to attract all classes of investors.

The corporation like the partnership is an association of individuals and interests who have combined their funds in a business undertaking with the hope of ultimate profit. A very important feature of the corporation lies in the fact that the fiction of the business enterprise is supported in this case by the attitude of the law which views a corporation as an entity separate and distinct from the personnel of its members. Limited liability and other important consequences follow from this view.

The members proper of a corporation are its shareholders. The interests of the shareholders in the joint investment are evidenced by formal instruments known as stock certificates. The total of the capital stock outstanding constitutes the formal expression of the stockholders' equity in the business. Outside interests, known as the creditors, also furnish capital. The bondholder is the most important investor of this class.

The modern business corporation with its vast aggregate of property and its complexity of property rights, furnishes the more difficult problems of accounting analysis. In the next section some features of the large scale enterprise will be further emphasized.

In all of these forms of business organization the interests of the private owners are uppermost. It is the private investors who largely control operation. It is the owners or their employees who keep the accounts. Consequently the influence of the private equities upon accounting concepts and methods is predominating.

The ownership of economic goods is not restricted to what may properly be called the business enterprise. The owner of a residence and other consumption goods, for example, may have a considerable estate. Semi-business associations with a considerable capital investment which have as a purpose the furthering of some philanthropic or similar end are also common. The

municipality or state often owns large aggregates of property. A communistic community may own property devoted to both consumptive and productive purposes. In these cases, however, while it is possible and usually necessary to make use of accounting records, the typical problems of accounting do not present themselves. The private business enterprise, organized for pecuniary profit, is the typical accounting unit, and the discussion of accounting principles in this text will be restricted primarily to a consideration of the problems arising in connection with such enterprises.

#### THE NEED FOR ACCOUNTING ANALYSIS

It is the function of accounting, then, to present a record of the various properties owned by the business enterprise and a showing of the equities in the enterprise. The importance of accounting and related branches of statistical science in modern business can be emphasized by a brief consideration of some general characteristics of large scale production and certain other aspects of the present industrial situation.

In the first place the mere size of the modern business unit should be stressed. To-day the large scale enterprise, operating a huge plant and selling goods in a world market, is a familiar fact. One of the most important influences making possible this concentration of capital has been the tremendous improvement in transportation facilities and the consequent extension of the market. The development of the corporate form of organization mentioned above is another important factor contributing to (or at least accompanying) the growth of large scale production. This form of business organization makes possible the bringing together of vast aggregates of capital. Some large corporations have many thousands of stockholders. Evidently mere size and complexity of organization contribute to the need for extensive statistical records.

Closely connected with the large size of the modern business unit is the great variety of property types used in production. The production of transportation service, for example, involves the use of many kinds of property such as, land, bridges, tunnels, rails, ties, buildings, rolling stock, various kinds of services, etc.

Similarly in manufacturing and other industries (in fact wherever large scale production is developed) a complex equipment is necessary. This complexity of property bears an important relation to the problem of financial accounting. The heterogeneous character of property is one of the factors which necessitate the use of value units; *e.g.*, it is impossible to add railroad tracks, buildings, bridges, etc., without reducing all of these items to a common denominator. Further, the problem of ascertaining the amount of property expired in any given period is complicated by the great variety of property used.

The problem of valuation is rendered still more difficult by the fluctuations in price to which the modern market is susceptible. In a static economic society the problem of ascertaining the status of property is largely physical. Physical units in such a case could be converted directly into value terms; for value can be measured in terms of the item itself. The medieval shepherd, for example, could count his wealth and his income in sheep. But the continual fluctuations in the level of prices, which constitute changes in the measuring unit itself, complicate the process of valuation, and may require recognition in the statistical records. Indeed, it is prices under the present system that "render possible the rational direction of economic activity by accounting, for accounting is based upon the principle of representing all the heterogeneous commodities, services, and rights with which a business enterprise is concerned in terms of money price."<sup>1</sup> The point should be emphasized that accounting in modern times deals directly and primarily with the value representations of things; the use of physical facts in accounting statistics is entirely subordinate.

Another characteristic of modern business which has contributed to the present emphasis upon accounting is the specialization of securities which has been made possible by the development of the corporate form of organization as was stated in the preceding section. Not only do many individuals contribute capital to this type of enterprise, but their rights to income and property vary according to the class of security held. To-day one is familiar with common stock, preferred stock, mortgage bonds, debenture bonds, income bonds, collateral trust

<sup>1</sup> Mitchell, *Business Cycles*, pp. 31-32.

notes, etc. ; and some of these classes may be subdivided almost indefinitely. The task of preserving the rights between the different classes of security-holders is a difficult one, and cannot be satisfactorily accomplished without the aid of information based upon extensive statistical data.

A striking phenomenon of the modern industrial process is its susceptibility to trade disturbances. While the severity of the business cycle has been due in a measure to unsound banking and credit institutions, it should be recognized that reforms in this direction can never be more than palliatives. The essential cause of the business cycle is the difficulty experienced by the entrepreneur and the business world generally in accurately forecasting the market situation. It is coming to be recognized that extensive dissemination of complete and reliable information concerning the entire industrial process is the most promising remedy for alleviating this condition. The data concerning the financial situation furnished by the accounts form an important part of the information necessary for the construction of a trade barometer.

The present tendency toward public control and regulation of industry is another factor which emphasizes the need for accounting analysis. The public has awakened to the need for controlling the activities of the entrepreneur when the interests of the individual conflict with those of society. Further, the complexity of the private equities involved renders more emphatic the need for government interference. The public can pass sound judgments on the complex situations that arise only on the basis of reliable statistical information.

Much emphasis is being placed at present upon the necessity for internal economy of organization in industrial enterprises. There are several causes for this situation. First may be mentioned the fact that the opportunities to increase revenues through the exploitation of undeveloped natural resources is largely past. In addition to this, the technique of industry, which has undergone tremendous development in the past century and a half, is becoming standardized ; this means that the opportunities for building large fortunes through the development of inventions are more restricted than formerly. As the country grows older, as population increases, as competition becomes keener, the

need of efficiency in production is emphasized. The problem of improving the utilization of our economic resources is one of the most important of modern questions. The solution of this problem requires a very extensive statistical analysis of the productive process.

#### THE GENERAL PROBLEMS OF ACCOUNTING

From the standpoint of the equities involved the accounting records of a business enterprise should furnish two kinds of statements: (1) a history of the operation of the enterprise during the fiscal or accounting period; (2) a statement of the financial status of the business at the end of the period.<sup>1</sup> These statements, the income sheet and the balance sheet, present the results of the entire accounting process. The income sheet shows a summary of all the outlays necessary to the operation of the business and all revenues accrued. The balance sheet presents a statement of all the property items at a given moment, and shows the distribution of the ownership in the same.

The income sheet may be used for managerial purposes, and it is of general importance in deciding questions of equity. If the entire property is owned outright by one person, inaccuracies in this information or an entire absence of such data cause no injustice between individuals. If the number of investors is large and if their equities vary considerably in character, however, the problem of ascertaining these facts is at once more difficult and more important. In the corporation, for example, the personnel of the investors is continually changing, due to the ease with which securities can be transferred from one individual to another. Thus if an error in stating net revenue is made in one period it is probable that the rights of some of the individuals whose equities have been misstated cannot be restored by the correction of the error in a later period. Further, there is the added difficulty of apportioning the annual net revenue among the various classes of security-holders. This may be illustrated by the case of a certain company which has outstanding, among other equities, six per cent non-cumulative preferred stock. Through an error in accounting analysis in the annual income

<sup>1</sup> Cf. Hatfield, *Modern Accounting*, p. 5.

sheet for one year, net revenue as shown was not sufficient to pay the regular six per cent dividend. The loss of this dividend by the preferred stockholders cannot be regained in later periods. In fact, this loss will inure to the benefit of the common stockholders. Assuming that it is possible to expand the business and increase net earnings through the retention of profits in the enterprise, it would be to the advantage of the common stockholders, who have the larger element of control, to adopt a policy which would lead to an understatement of net revenue. The accountant is called upon to pass judgment upon accounting procedure which affects net revenue, and hence the relations between the various equities.

Similarly the status of the equities represented in the enterprise must be determined at various moments of time. Not only must net revenue be apportioned between the different classes of investors, but the status of each equity must be shown after this division is made. The determination of net revenue and hence the condition of the equities involves the problem of valuation; *i.e.*, the ascertaining of property expirations and property balances. Only from such information in regard to the condition of property can the financial condition of the equities in the enterprise be ascertained. These data must be furnished to the present investor if he is to know the status of his investment. The prospective creditor or investor must also have this information if he is to proceed rationally in the use of his capital. Further, if the state is to do justice to all parties concerned in the adjudication of disputes, such statistics must be available.

Ordinarily only the individuals who furnish capital to an enterprise are considered as having equities in the property. Under certain conditions, however, the public interest approaches the nature of an equity. The state always reserves the right to appropriate a portion of investment or revenue by taxation. Further, in so far as the state assumes control of prices and methods of financing, it has an interest which carries with it more control than the equity of the private investor. In the case of the municipal enterprise already mentioned the public exercises complete ownership, and here the public interest constitutes a distinct equity. The continued recognition of the

rights of private property still insisted upon by the courts, however, makes it imperative that action tending toward public regulation shall not injure the private equities. Consider the regulation of railroad rates, for example. It is recognized that railway transportation is a quasi-monopolistic industry and that the proper rates cannot be fixed by competition. The public has determined that the rates shall not be exorbitant. The courts, having in mind the rights of private property, insist on the other hand that the rates fixed by the state shall be high enough to yield a "reasonable return on the fair value of the property." The point should be emphasized that the viewpoint of the private equities is *still* dominant in accounting.

Even the rights of the laborer represent an equity in the business enterprise when the term equity is broadly interpreted. The wage-earner's right to a portion of the earnings of an enterprise has a definite legal status. Especially in certain industries is the laborer coming to have an authoritative voice in the control of operation. Although the interests of the laborer and the public are not recognized in the accounting records as equities *per se*, still the accountant must recognize the influence of both of these interests upon accounting problems. It is possible that in time a more definite recognition will be given these equities in the accounts.

Although the statistics of management are closely connected with the problems of the equities, and are in a sense subsidiary to them, nevertheless this branch of accounting requires the use of other information than that furnished by the purely financial records. A further analysis of both physical and value facts is necessary for efficient management. The manager must have the information necessary to base rational judgments as to the effective utilization of the resources at his disposal. The relation of this question to financial success, and the tendency to emphasize this phase of accounting, can be illustrated from the railroad industry. Twenty-five years ago the attention of the operating officials was centered upon the gross revenue figure, rather than upon costs. The conquest of new territory through the extension of main lines, and the development of branch lines and feeders, characterized the railroad industry and made possible the constant and rapid growth in gross revenues. Economy

of organization was entirely overlooked in the scramble for traffic. To-day gross revenue has reached a more stable position. No longer is it possible to cover up gross inefficiency in management with revenue from constantly increasing traffic. In view of the rise in wages and other expenses the only possibility of preserving the margin of profit is through an increase in efficiency. This situation is reflected in the building of new roads. In late years the increase in mileage has been comparatively insignificant, although a considerable extension of trackage has been made; that is, lines are not being extended, but already existing lines are being double-tracked and otherwise improved.

This situation is duplicated in all lines of industry. To prevent costs from encroaching upon the profit margin, managerial efficiency is necessary. The manager is called upon to pass judgments as to the most effective utilization of the economic factors available. What are the most effective combinations of factors? What are the most efficient processes? What are the best methods of organizing and paying labor to secure efficiency in production? These and similar questions the managers must answer. It is the function of *cost accounting*, so-called, to furnish the statistical information necessary to aid the manager in making these judgments.





**PART ONE**  
**ELEMENTS OF ACCOUNTING**



## II

### THE THEORY OF BALANCE SHEET ACCOUNTS

THE first step in the study of accounting is the mastery of the main principles underlying the construction of modern financial accounts. The details of bookkeeping procedure can be more readily grasped, and the significance of specific questions of accounting analysis can be more fully appreciated, if the student is able to refer these matters, as they arise, to a background of general principles. It is the purpose of the present chapter and the next to furnish this background by explaining the structure of the principal types of accounts in terms of the important facts and concepts with which accounting is concerned.

#### THE FUNDAMENTAL CLASSES OF DATA

As was emphasized in the preceding chapter, the important unit of organization with which accounting deals is the specific business enterprise. The fundamental concepts of accounting can be defined, and the nature of the system of accounts necessary to record the various happenings which may occur can be adequately expressed, only in terms of the needs and purposes of a particular business concern. It will be convenient, therefore, to take a hypothetical business, the A. B. Co., at its inception, and to classify the facts which its accounts must show, both at the outset and after operation has begun. The structure of the accounts will be explained in terms of this classification.

The A. B. Co., it may be supposed, is a small manufacturing enterprise, completely organized and ready to begin operation. What are the data necessary to a statement of the firm's financial status? What fundamental classes of *value* facts can be discovered? Clearly one important category embraces all the

property or *asset* items to which the A. B. Co. has title. If any conclusions are to be drawn as to the financial condition of this company, a complete statement of property must be available. This property might consist not only in many different kinds of tangible goods, but also in valuable rights, securities, etc. Materiality is no satisfactory test as to what is or what is not an asset, and this is one of the important facts which must be kept in mind if one is to appreciate the significance of the term. An asset can be defined as *any consideration, material or otherwise, owned by a specific business enterprise and of value to that enterprise*. Thus an asset is essentially an economic fact, and in the strict accounting sense must be connected with some particular business establishment.

In preparing a statement of the financial condition of an enterprise the various kinds of assets can be listed or classified very minutely, or they can be stated under a few heads. How far these items shall be subdivided is purely a matter of convenience, depending upon the character of the enterprise in question and the particular purpose which the classification is intended to serve. A small mercantile establishment may require but a few classes of property; a railroad corporation may make use of hundreds of distinct assets. The property of the A. B. Co., it will be assumed, consists in the following assets: land, \$40,000; building, \$70,000; equipment, \$20,000; materials, \$80,000; cash, \$15,000. Then the financial statement of the firm must show this list of assets; and the items may be arranged in any intelligible way. A convenient method of presentation is the listing of the assets in a column, one below another, thus:

ASSETS		*
Land . . . . .		\$40,000
Building . . . . .		70,000
Equipment . . . . .		20,000
Materials . . . . .		80,000
Cash . . . . .		15,000
Total . . . . .		<u>\$225,000</u>

Does this list of facts present a satisfactory statement of the financial condition of the company? Does a statement of assets cover all of the logical classes of data involved in the enterprise?

No, such a statement is clearly inadequate, either from the standpoint of the interests of the A. B. Co., a probable purchaser of — or investor in — the business, or any other party concerned. The situs of the title to this property must be determined. What are the *claims against or rights in* this property? Where is the *distribution of ownership*? Or more concisely: what are the *equities* in these assets?

The equities like the asset items may have a variety of forms. The particular interest which has immediate control of operation may own all the assets clear, or it may have only a small net interest in the property and the greater part of the ownership may be vested in outside parties whose claims may consist in contractual liens and rights represented by bonds, mortgages, promissory notes, accounts payable, etc. In this case it will be assumed that the rights in the assets, or equities, consist in the following items: the proprietors' equity, \$170,000; mortgages, \$35,000; notes payable, \$20,000.

The first of these items — often called *proprietorship* — represents the owners in the narrow sense; it is the equity of those who have the large element of direct control of business operation and financial policies. In a single-proprietor enterprise the "capital" and "personal" accounts of the individual proprietor furnish a record of this equity; and in a partnership the capital and personal accounts of the individual partners are used to represent proprietorship. In the case of an incorporated enterprise proprietorship is represented by the capital stock outstanding less the discount or deficit if any item of this nature is present, or capital stock plus surplus if any such item exists. For the time being it will be advisable to postpone further discussion of the general nature of this equity or its peculiarities under different forms of organization; and in the case of the A. B. Co. this item can be designated simply by the name of the firm. Because of the fact that the proprietors' equity represents the parties in immediate control, and because this equity is often — although not always — much the largest in amount, proprietorship is the most important equity from the standpoint of accounting; and in later chapters it will be necessary to discuss in some detail its accounting significance.

These equity facts may be listed in a column, as was done in

the case of the asset items. The two columns may now be grouped in any convenient way. The following arrangement is a conventional form :

ASSETS		EQUITIES	
Land . . . . .	\$40,000	A. B. Co. . . . .	\$170,000
Building . . . . .	70,000	Mortgages . . . . .	35,000
Equipment . . . . .	20,000	Notes Payable . . . . .	20,000
Materials . . . . .	80,000		
Cash . . . . .	15,000		
Total . . . . .	\$225,000	Total . . . . .	\$225,000

This *balance sheet* form of presenting a statement of a firm's financial condition at a given moment is a lucid and concise way of showing the necessary facts, although it is not the only possible method. The essential thing is to have all of the facts presented and arranged in the most intelligible form ; and from every point of view it appears desirable to separate in some way the two distinct categories, assets and equities. One writer has observed that the balance sheet is the "groundwork of accountancy."<sup>1</sup> Certainly the balance sheet as conceived in the above table represents a classification of facts which is the basis of the fundamental accounting concepts and the technical structure of the accounts.

#### THE ACCOUNTING EQUATION

It is apparent that these two classes of facts will in every case be numerically equal, for they are, in a sense, merely different aspects of the same thing. The asset class constitutes a list of objective property items ; the equity class represents the legal relationships between this same property and certain individuals or interests. That is, one class represents the valuable commodities and rights of a given enterprise, the other class represents the distribution of ownership, or the claims against assets, or, more exactly, the equities in assets.<sup>2</sup> And since the same

<sup>1</sup> Sprague, *The Philosophy of Accounts*, p. 26.

<sup>2</sup> To observe strictly the legal fiction in the case of an incorporated enterprise one should say, not "equities in assets," but *equities in the enterprise*. A stockholder, for example, has no claim or title to any specific asset. From the standpoint of accounting, however, it is no serious error to say that an equity, in every case, is virtually a *right in assets*.

measuring unit, the dollar, is used in stating both classes of facts, the totals are always numerically equal.

One or two simple illustrations may serve to make clear the nature and necessity of this fundamental equation. A certain individual has \$100 in cash in his pocket. This represents his entire capital, and he has no obligations. What are the facts necessary for a complete representation of his financial status? There are two essential facts present. The cash in his possession has two aspects: one is its significance as an objective bit of property; the other is the fact of the ownership of this asset. Looking upon the individual as an enterprise, then, his balance sheet would appear as follows:

ASSETS		EQUITIES	
Cash . . . . .	\$100	An Individual, Capital . . .	\$100

Both classes of facts — property and the ownership of that property — are present, whether expressed or not. In a simple situation such as this, it might well be that the owner of the cash would take his ownership for granted, and if asked to prepare a statement of his financial condition he would probably present, simply:

#### AN INDIVIDUAL, FINANCIAL STATEMENT

Cash . . . . .	\$100
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This does not mean that both classes of facts are not present — inevitably; but in this case the actual classification is not made.

On a student's desk ten books are scattered, worth, it may be assumed, one dollar apiece. The student owns seven of these books, and three are borrowed from his next-door neighbor. A balance sheet representing these books and their ownership as an enterprise would then appear as follows:

ASSETS		EQUITIES	
Books . . . . .	\$10	Student, Ownership . . . .	\$ 7
		Neighbor, Ownership . . . .	3
Total . . . . .	\$10	Total . . . . .	\$10

It would seem fairly obvious, then, that assets and equities are always equal, no matter how simple or complex may be the situa-



tion or enterprise under consideration. Assets and equities are distinct but interdependent classes of facts. One class cannot exist without the other, and the *totals* in each case are equal. This classification, and its equality, is at the foundation of every system of modern accounts. Business transactions consist essentially in the alteration of one or both members of this equation; but the equality of totals — as will be shown a little later — is continuously maintained.

Certain apparent exceptions in accounting practice to this fundamental equation should be briefly noted at this point. A feature of the structure of modern accounts which will be explained in detail in the next section of this chapter is the substitution of addition for subtraction wherever possible. This procedure secures neatness, and economy of clerical effort; and there are in many cases special reasons for maintaining original figures. It is convenient, for example, to list securities in the accounts at par. If, then, a company secures its capital through the issue of securities at a discount this will mean that the nominal (par) value of the securities outstanding is greater than the amount of cash and other assets actually invested. Then if this par value is recorded as an equity, instead of the actual amount of the equity, the extent to which this item is overstated may be indicated by including the amount of the discount among the asset items.

A corporation, for example, issues capital stock to the amount of \$50,000 (par value) although the actual investment made by the stockholders is but \$45,000. In other words, the stock is issued at a discount of ten per cent. The balance sheet representing this condition would appear, in summary form, as follows:

ASSETS		EQUITIES	
Cash and Other Assets	\$45,000	Capital Stock	\$50,000
Discount on Stock	5,000		
Total	\$50,000	Total	\$50,000

The item of discount is not an asset but a deduction from an equity, capital stock, which is maintained in the records at nominal figures. Actual assets amount to but \$45,000, and therefore the amount of actual ownership is also but \$45,000. The funda-

mental equation exists in this case as in all others, although there is an apparent discrepancy equal to the amount of the discount.

Similarly, whenever the assets of an enterprise are being dissipated through losses, and the equities are maintained at the old amounts, there is an apparent discrepancy. But the use of original figures for the equities when assets have disappeared is purely conventional. In the case of insolvency equities nominally exceed assets, but virtually the equation is maintained — the insolvent firm pays less than one hundred cents "on the dollar."

Further, asset items are sometimes left at original figures for various reasons and deductions are listed among the equities. It will be sufficient at this point to say that the substitution of addition on the opposite side of the equation instead of actual subtraction, or, as it is sometimes put, the use of *valuation* items (see Chapter III) explains all apparent exceptions to the equation, assets equal equities.

It is customary to denominate the right-hand member of the equation *liabilities*. It might be urged that this is improper terminology, since this term has the connotation of debts or outside obligations and this meaning clearly does not apply to the proprietor's equity. If the term equities — which covers all elements of ownership — were used instead, there would be less danger of misunderstanding. For it must be recognized that there are important distinctions between proprietorship and the liabilities proper. The liabilities are contractual in character; proprietorship is residual. The liabilities carry less control and risk and have contractual rights to income; the proprietor's equity carries the large element of control and risk and has residual rights to income. These distinctions can be more sharply drawn in the case of the small single-proprietor enterprise or partnership than in the large incorporated enterprise. In the typical modern corporation the important aspects of ownership — control, risk and income — have been so subdivided and combined through the specialization of securities that it is difficult, in many cases, to define proprietorship clearly. Nevertheless the general distinction exists, and to include proprietorship and contractual obligations under the caption, liabilities, is very confusing. To avoid this confusion the term equities will be

used throughout the text to designate the right-hand member of the balance sheet equation.

The financial statistics of any business enterprise can thus be listed in two fundamentally distinct and numerically equal classes, assets and equities; and, as was stated above, the essence of any complete system of accounts consists in the separation of the members of this equation and the maintenance of this classification. With this equation as a basis a convenient and intelligible system of ordering and presenting the necessary facts is built up; and — as will appear later — an important characteristic of this system is the test for arithmetical accuracy afforded by this continuous equation. The explanation as to how the accounts are constructed from this basic classification will now be undertaken.

#### THE CONSTRUCTION OF ACCOUNTS

The hypothetical A. B. Co. begins operations. It will be necessary at this point to consider briefly just what the operation of a business enterprise means in terms of the effect upon the asset and equity classes. An equipment of commodities such as land, buildings, tools, raw materials, etc., together with services such as ordinary labor, management, advertising, insurance, etc., is incorporated with the services of the owners<sup>1</sup> themselves and results in a flow of product — either commodities or services — which is sold to the consuming public. The continued production of this commodity or service can be secured only at the expense of constant decay, replacement and change among the asset elements involved. In other words there will always be a continual *shifting* among the asset items as business operation proceeds. Similarly as respects the facts of ownership a process of transposition and general change will normally be taking place: the amounts and character of the equities will be altered from time to time.

It is evident that the accounts of an enterprise should be so constructed that record may conveniently be made of these

<sup>1</sup> The individuals and interests represented by the equities furnish the capital invested in the enterprise and have ultimate control of operation. The proprietors, particularly in small enterprises, often furnish labor services as well as capital.

changes which occur on both sides of the fundamental equation. It would be possible to follow these changes simply by altering in the proper amount and direction the asset and equity items as they appear on a tabular financial statement such as was given above, and when new types of assets are secured, or when new equities appear, these new headings could be listed in the same way. An obvious objection to this procedure is its inconvenience for any but the simplest cases. The fundamental objection is that accounting statements so constructed would throw little light upon the business process, and, as was emphasized in the preceding chapter, the data of the historical as well as the synoptic situation are necessary to meet the needs of the different interests involved.

It will be necessary, then, to extend or stretch out the above financial statement of the A. B. Co. so that space will be available for the recording of the transactions which may affect the original amounts. This virtually means the opening of an *account* for each kind of asset and for each equity, thus :

Land	A. B. Co.
\$40,000	\$170,000
Building	Mortgages
\$70,000	\$35,000
Equipment	Notes Payable
\$20,000	\$20,000
Materials	
\$80,000	
Cash	
\$15,000	

Now what, in the first place, will be the effect upon asset amounts of the various transactions which may occur? Clearly asset items may be altered in two directions: an asset balance may be either increased or decreased — there may be additions to assets or there may be subtractions or withdrawals from assets.

It is evident that all possible change can be summed up in this numerical manner when one realizes that it is not the building or machine which is recorded in the accounts but rather its *value* representation. That is, immediately speaking an asset is an amount, and although changes in this amount may be due to various causes they can occur in but two directions — the positive and negative.

Accordingly it will be desirable to have two separate columns under each asset heading, one for additions or positive items and one for subtractions or negative items. Now how shall these columns be arranged? Shall the positive items be preserved at the left and the subtractions at the right or *vice versa*? The answer to this question is not at all a matter of principle; either arrangement will serve as well as the other. In the tabular statement of assets and equities given above the asset items were set at the left and the equity balances at the right. This is the conventional arrangement followed in this country although the English practice is just the reverse. The essential thing is a separation of the two fundamental classes of facts; the arrangement of data after the classification is made is a matter of comparatively little importance. But if it is decided to have *left* stand for asset balances and *right* for equity balances in the accounts, then it will be necessary in the positive and negative columns under each asset heading to use the left-hand column for additions and the right-hand column for subtractions, in order to preserve positive balances at the left. This gives the essential nature of any modern account: two columns, one for additions and one for subtractions; and custom decrees that in asset accounts the left-hand column shall be used for additions, the right-hand for subtractions.

Similarly, transactions affecting the equity items may result in either increasing or decreasing an equity balance. Consequently each equity account has need of two columns, a positive column for additions and a negative column for subtractions. What shall be the arrangement of these columns? Again the answer is that the arrangement is an arbitrary matter, the only essential consideration in constructing the accounts being the preservation of the fundamental classification, assets and equities. But, since it was decided to keep positive asset balances

at the left and equity balances at the right, it will be necessary in the positive and negative columns under each equity heading to use the right-hand column for additions and the left-hand column for subtractions.

It is important to note that the definition of the account in terms of parallel columns, as given above, is somewhat arbitrary. A balance sheet account, in a broad sense, consists in a record of plus and minus happenings in connection with some specific asset or equity item. The parallel-column arrangement is only one of many possible devices for presenting such a record. Various symbolic schemes as well as other methods of spatial arrangement could be readily suggested. Plus and minus signs, for example, might be used to designate additions and subtractions respectively, or inks of different colors. An actual physical separation of plus and minus items is very desirable, however, from the standpoint of clerical efficiency; and because it makes such a separation the parallel-column arrangement is a highly practicable device. Hereafter in speaking of an account the conventional form will be understood.

The scheme of the construction of the balance sheet accounts in their relation to the fundamental classes can be represented thus:<sup>1</sup>

<sup>1</sup> These accounts — since each is a distinct unit — might be arranged in any order whatever without disturbing the equality of left-hand and right-hand balances. Thus, in practice, the accounts of an enterprise are often kept in a bound volume, arranged, not in asset and equity groups, but alphabetically.

## PRINCIPLES OF ACCOUNTING

THE A. B. Co.

## ASSETS

## EQUITIES

ADDITIONS	SUBTRACTIONS	SUBTRACTIONS	ADDITIONS
Land		A. B. Co.	
\$40,000			\$170,000
Building		Mortgages	
\$70,000			\$35,000
Equipment		Notes Payable	
\$20,000			\$20,000
Materials			
\$80,000			
Cash			
\$15,000			

Thus far, then, it appears that all asset balances are arbitrarily listed on the left-hand side of the asset accounts, and all equity balances on the right-hand side of the equity accounts; and the fact should be emphasized again that the most important consideration controlling the construction of these accounts is the maintenance of the classification represented by the equation, assets equal equities.

#### CLASSES OF TRANSACTIONS

To illustrate the way in which business transactions are recorded in the accounts a few typical occurrences will be analyzed and their effect upon the fundamental equation noted.

a. Raw material is purchased by the A. B. Co. for cash, \$600. This illustrates a very common type of transaction. One asset (usually cash) is paid out and another kind of asset of equal value is received in exchange; this means a subtraction from one asset and an equal addition to another. Proceeding in the manner outlined in the preceding section an entry of \$600 must be made in the right-hand column of the Cash account and an equal entry in the left-hand column of the Materials account. This gives two equal entries in opposite columns, and the original equality between asset balances and equity balances is undisturbed. The purchase of any commodity or service for cash or an equivalent gives a transaction which comes under this head. Such occurrences obviously affect only one member of the balance sheet equation, the assets; and the *total* of the assets is unchanged. Such transactions involve simply plus and minus occurrences among the various assets — transpositions of assets. They are all recorded in this way.

b. The A. B. Co. is planning some heavy purchases of materials and other supplies and borrows \$5,000 from a bank on a ninety-day note. Here an asset is increased and at the same time an equity, notes payable, is increased a like amount — an addition to cash and an equal addition to notes payable. This transaction would be recorded by a left-hand entry of \$5,000 in the Cash account and an equal right-hand entry in the Notes Payable account. Again the result is two equal entries in opposite columns, and the equation, assets equal equities, is main-



tained. This transaction affects both members of the equation but clearly does not disturb the separation of the two kinds of facts or their equality. A note of the A. B. Co. falls due and is retired with cash, \$1,000. This illustrates the reverse of the preceding transaction. In this case there is a decrease in assets, cash, and an equal reduction in an equity, notes payable. Hence it would be recorded by a right-hand entry in the Cash account of \$1,000 and an equal left-hand entry in the Notes Payable account. All transactions of the type which involve an addition to assets and an equal addition to equities, or a subtraction from assets and an equal subtraction from equities, are recorded in this way.

c. A transaction may involve a transposition of equities — an exchange of one kind of equity for another. The A. B. Co., for example, issues a first mortgage on land and building for \$5,000 in exchange for \$5,000 of outstanding notes payable. This transaction involves a subtraction from one equity, notes payable, and an equal addition to another equity, mortgages. It would be recorded by a right-hand entry of \$5,000 in the Mortgages account and an equal left-hand entry in the Notes Payable account. All such transactions clearly affect the equities only, and not the *total* of this class. And again the result is equal entries in opposite columns, leaving the equality of classes undisturbed.

d. A transaction may involve some combination of the above fundamental types. The A. B. Co., for example, buys additional equipment amounting to \$4,000, paying cash, \$2,000, and giving a ninety-day note for the balance. This transaction involves an increase in one asset, equipment, a decrease in another asset, cash, and an increase in an equity, notes payable. It would be recorded by a left-hand entry of \$4,000 in the Equipment account, a right-hand entry of \$2,000 in the Cash account, and a right-hand entry of \$2,000 in the Notes Payable account. All such transactions are simply combinations of the other types illustrated above, and give equal entries in opposite columns in every case.

Although there may be a great variety of combinations and examples of the above cases, these illustrations cover the fundamental types of transactions possible in any business enterprise.

An increase or decrease in an asset must be accompanied by an equal decrease or increase in another asset or an increase or decrease in an equity. And, reversing the order of statement, any change in an equity can only be explained by an equal and opposite change in another equity, or an equal change in an asset in the same direction. Further, any combination of these changes is possible. It appears, then, that every transaction is two-sided, that is, there is always an equal right-hand entry (or entries) for every left-hand entry (or entries) and *vice versa*; hence the original equality between the sum of the left-hand (asset) balances and the sum of the right-hand (equity) balances is continuously maintained.

#### DOUBLE-ENTRY — DEBIT AND CREDIT

The asset and equity classification arranged in parallel-column accounts is the basis of the device known as *double-entry* bookkeeping. The term double-entry originates in connection with the equality of opposite entries just explained. Conceived in this way the double-entry system is not an arbitrary construction depending upon a particular arrangement of data. It is rather a highly rational and logical system founded in terms of the fundamental classes of accounting data and constructed so as to record conveniently all changes in these classes. The system is thus more rational than is often appreciated. Any system is double-entry which represents all of the facts in the asset-equity classification. Any system of accounts which does not give all of this information is inadequate. *Single-entry* is the term applied to a number of methods of keeping accounts which do not represent all of the facts. In the case of very simple situations it may be possible to deduce all unstated facts from an incomplete set of accounts; but anything short of the complete double-entry system is usually more complex in the end. In this text the discussion of bookkeeping methods will be confined to the double-entry system.

In practice the left-hand side of all accounts is called the *debit* side and the right-hand column is called the *credit* side. In many explanations of double-entry bookkeeping an attempt is made to attach the significance of the words debtor and creditor to the

terms debit and credit as used in modern accounts. As used in personal accounts these meanings can with some reason be applied, for example :

A, CUSTOMER

(In account with the A. B. Co.)

<i>Dr.</i>	<i>Cr.</i>
\$500	\$100

Here the debit and credit headings of the opposite columns may be thought of as having real meanings. A, Customer is debtor to the A. B. Co. for the sums listed in the debit column and creditor to the A. B. Co. for the sums listed on the credit side. But the terms debit and credit are applied to the left- and right-hand columns, respectively, of all accounts in the double-entry system, and it is impossible, rationally, to attach such meanings to debit and credit elsewhere than in personal accounts. Etymologically these terms are doubtless related to the words debtor and creditor, but as now used they are merely conventional signs employed to designate left-hand and right-hand columns in the accounts. These expressions will be used only with this significance throughout the text.

A brief summary of the chapter will serve to emphasize some of the important points discussed. The system of accounts for a business enterprise is founded logically in the nature of the facts with which accounting deals. These data consist fundamentally in the two classes, assets and equities (rights in assets). The asset class includes all valuable items regardless of their material or immaterial character. Any commodity or service owned by a business enterprise and of value to that enterprise is an asset. The equities represent the distribution of ownership. These items can be roughly grouped as proprietorship and liabilities. This grouping is based upon the differentiation of owner-

ship into its principal elements. Assets always equal equities numerically for one class consists in the objective asset items, the other class represents the situs of the ownership of these same assets, and the same measuring unit, the dollar, is used in both cases.

Business operation means a constant process of shifting in both asset and equity items. Assets expire, are replaced, are exchanged. Any asset item may be increased or reduced. Similarly the process of change will mean increases and decreases in specific equity items. Accounts with the various items of assets and equities are built up to record these changes. The important characteristic of the conventional account is: two columns, one for additions, the other for subtractions. Arbitrarily it is decided to maintain asset balances in the left-hand column and equity balances in the right-hand column. Therefore, in asset accounts, the left-hand column is used for additions and the right-hand column for subtractions; and in equity accounts just the reverse is true. The only important consideration controlling this arrangement is the maintenance of the original equation.

All possible transactions can be classified under four heads: (1) an asset is exchanged for another asset of equal value; (2) an increase or decrease in assets takes place through an equal increase or decrease in equities; (3) an equity is exchanged for an equal amount in another equity; (4) a transaction may involve some combination of the above cases. In any of these cases equal entries in opposite columns are made for every transaction. Consequently the original equality between left-hand balances and right-hand balances is continuously maintained. This constant equality is an important clerical advantage because of the test for numerical accuracy which it furnishes.

The essence of the double-entry system of accounts consists in the separation of the members of the equation, *assets = equities*, and the maintenance of this classification and its equality. Thus the double-entry method is more than an arbitrary device for recording facts. The first step in the interpretation of accounting data is made in forming the two fundamental classes. In the double-entry system the left-hand side of all accounts is called the debit side, the right-hand is called the credit side.

The simplest rule for debit and credit is based directly upon the fundamental equation. *Debit indicates additions to assets and subtractions from equities; credit indicates additions to equities and subtractions from assets.* The terms debit and credit have no other important significance as used in modern accounts.

In the next chapter will be explained the construction of the special types of accounts necessary to record certain classes and phases of the assets and equities which appear in the process of business operation.

### III

#### THE CONSTRUCTION OF SUPPLEMENTARY ACCOUNTS

It was noted in Chapter I that an adequate system of accounts for a business enterprise should furnish a record of the history of operation as well as the facts necessary to a statement of the concern's momentary financial status. The balance sheet accounts, which were explained in the last chapter, show the condition of the enterprise at the beginning of any given period of operation; but because of the complexity of the business process many additional accounts are necessary in which to record systematically the various transactions of the operating period which may affect the original equation. Not only are there some accounts necessary which are not in the first balance sheet but which become incorporated in succeeding financial statements, but special groups of accounts are needed which never appear in a statement of assets and equities. In the present chapter the construction of the important types of these supplementary accounts will be explained.

#### CURRENT ASSET ACCOUNTS

It was stated in the last chapter that the operation of a business enterprise may be conceived as the combination of a more or less considerable variety of purchased commodities and services with the services of the owners themselves for the purpose of producing some other commodity or service for sale. Now it is obvious that, in the case of the A. B. Co. (referring again to this supposititious concern) or any other enterprise, there will necessarily be involved in production other types of commodities and services than those the firm has on hand at the moment operation begins. The assets of the A. B. Co. listed in the preceding chap-

ter were land, building, equipment, materials and cash. The first three of these items are *fixed* assets, representing the more or less permanent equipment of the enterprise. The only *current* assets on hand, then, are raw materials and cash. If this is a typical manufacturing enterprise, other kinds of current commodities and services will be necessary in the process of producing the finished article. Labor services are necessary in practically all productive processes; and certainly the A. B. Co. will be obliged to purchase labor from time to time if operation is to proceed. The services of insurance and advertising will doubtless be secured; it will be necessary to buy stationery, fuel and other supplies. The number of classes of such commodities and services required in any case will, of course, depend upon the needs of the particular enterprise under consideration.

The question arises as to how accounts with supplies, fuel, insurance, etc., will fit into the scheme of asset and equity accounts thus far outlined. What is the nature of these items? As the student easily becomes confused at this point it is desirable to answer these questions with considerable care.

These items *at the moment of purchase* fall into the category, assets. This is fairly obvious in the case of such tangible items as coal, stationery, etc. Coal in the bin is clearly just as much an asset as show cases and other store fixtures. Further, as was noted early in Chapter II, the asset concept may apply with equal propriety to material and immaterial items. All things for which one must pay are assets at the moment of purchase, whether the thing secured be a commodity or a right to services. Hence, services such as insurance, advertising, etc., in so far as such items represent future goods, are assets. They are all economic goods and are so considered by the business man. When a proprietor buys insurance service, for example, and pays cash, he expects to receive a value equivalent for his expenditure, just as in the case of buying a machine, a building, or any other item of physical property. Valuable services are to him just as truly asset items as are valuable commodities. If one approached the owner of some business with the idea of buying him out, what would the prospective seller include in a statement of his property? Certainly he would include fuel, stationery and other supplies on hand, as well as building, fixtures and merchandise.

And further, if there are any insurance services, advertising services, or any other valuable services or rights which have been purchased but are not yet consumed, or from which the entire benefit has not yet been exhausted, the balances of such items would be listed as assets.

There are important reasons for distinguishing the current assets from the more permanent forms of property, and it is not intended here to minimize or obliterate the distinction between the two groups. Nevertheless it should be recognized that the general class, assets, covers all these current items as purchased. It cannot be too emphatically urged that as far as the structure of the accounts is concerned there is no distinction whatever between the accounts used to record current assets and the balance sheet asset accounts described in Chapter II. The purchase of coal can be conceived as exactly analogous to the purchase of real estate, and the entries representing such a purchase are made according to the same rules in either case. The difference between buildings and fuel is not that one is an asset and the other an *expense* (see the following section) or asset consumed; the only line that can be drawn is the relative *permanence* of the former as compared with the latter item. A shipment of coal may be largely consumed in a month; a building may last twenty years. The distinction made in economic theory between circulating and fixed capital follows much the same line of demarcation as this distinction between current and fixed assets.

How far the classification of current assets should be carried in the accounts in any given case is purely a matter of convenience, depending upon the nature of the particular enterprise under consideration and the needs and purposes of the management. In some cases these items may be grouped under a few heads; in others a long list of accounts is necessary. For purposes of illustration it will be assumed that the A. B. Co. has four accounts in which to record the purchases of current assets: Supplies, Fuel, Insurance, and Miscellaneous Assets. This would in most cases be a very inadequate list of such accounts for a manufacturing enterprise, and it must be understood that these accounts are given, not as a proper classification for an actual business, but merely to make the discussion more concrete. According to the above analysis these accounts should



*be opened in exactly the same way as the asset accounts described in the preceding chapter — the left-hand column being used for additions, the right-hand column for subtractions, thus :*

ADDITIONS	SUBTRACTIONS
Supplies	
Fuel	
Insurance	
Miscellaneous Assets	

Then if coal were purchased for cash, \$60, the transaction would be recorded by a left-hand — or debit — entry of \$60 in

the Fuel account (representing the addition to an asset) and a right-hand — or credit — entry of the same amount in the Cash account (representing the subtraction from an asset). All purchases of current assets, whether commodities or services, would be similarly recorded in the debit columns of the proper accounts.

#### EXPENSE AND REVENUE ACCOUNTS

The point was made in Chapter I that one important purpose of the financial records is to show the increase or decrease in the equities in a given period, and the process whereby this change is attained. Because of the complexity of the actual business process it is impossible to record the changes in ownership directly in the equity accounts as they occur. Special groups of accounts are necessary in which certain phases of the assets and equities are recorded as the facts are ascertained, and later the information shown by these special accounts is gathered together and its net result incorporated in the balance sheet equity accounts.

The positive phase of the equities which arises during business operation is *revenue*. Revenue represents the sale of product, or, more exactly, the additions to the equities which occur through the sale of the owners' services embodied in the finished product. Whether the product of the firm in question be a commodity or a service, the sale of the commodity or service gives rise to revenue. It is impossible in practice, however, to determine all expirations of assets which have occurred in the process of production concurrently with the additions to assets made from the sale of product. Such expirations are those which are due to business operation and the passage of time, for example: the consumption of coal in the furnace; the depreciation of buildings. Consequently revenue from the sale of product usually represents *gross* rather than *net* additions to the equities. It becomes necessary, then, at certain intervals to subtract from the revenues the decreases in assets not previously recognized in the accounts. This can be done by making subtractions from the revenue accounts directly, or these subtractions may be listed in distinct *expense* accounts, in which case the net change in the equities may be determined by combining the amounts listed in both of these groups of accounts.

If the necessary commodities and services which a firm acquires were imperishable (in the economic as well as the physical sense), then the sale of product would give rise to a net increase in ownership, for no deductions would be necessary. Although it is difficult indeed to discover an actual enterprise which even approximates this condition, a consideration of such a case will serve to throw some light upon the nature of the important concepts of revenue, expense and net revenue.

A certain individual has \$5,000 on deposit in a savings bank. His business, it might be said, consists in furnishing the use of capital. A balance sheet for the enterprise would appear as follows:

ASSETS		EQUITIES	
Cash . . . . .	\$5,000	An Individual, Ownership .	\$5,000

The bank, it will be assumed, pays four per cent interest on deposits. At the end of a year \$200 in interest has been earned. The balance sheet would now appear:

ASSETS		EQUITIES	
Original Cash . . . . .	\$5,000	An Individual, Original	
New Cash . . . . .	200	Ownership . . . . .	\$5,000
		An Individual, New	
		Ownership . . . . .	200
Total . . . . .	\$5,200	Total . . . . .	\$5,200

In this case the increase in assets, \$200, means an increase in equities of an equal amount. Revenue, then, is *net*, for no expirations of original capital are involved. The entire amount, \$200, constitutes a payment for capital service (the pure service of the proprietor); and since the investment remains intact this amount constitutes at once a net increase in assets and a net increase in equities.

The typical business enterprise, however, is not at all represented by such a case. Even a firm engaged primarily in loaning capital will usually have certain costs, such as rent, labor, stationery, etc., incident to operation. And in a manufacturing or retail business from eighty to ninety per cent of the assets received from the sale of product may be necessary to replace the outlays

required in the production of that product. This means, in other words, that large deductions must be made from gross revenue, through the expense accounts, before the net return to ownership is determined.

Expense and revenue accounts, therefore, may properly be considered as subsidiary equity accounts, recording gross additions to and gross subtractions from the equities; and the construction of such accounts is analogous to that of the equity accounts described in the preceding chapter. Items of revenue, which constitute gross additions to the equities, are listed in the right-hand column of the revenue accounts. Items of expense are listed in the left-hand column of the expense accounts because these amounts constitute subtractions from revenue.

It is important to note that the concept of expense can be most adequately defined in relation to revenue. *Revenue represents gross additions to equities; expense represents subtractions from revenue.* This relation can be shown graphically, thus:

SUBTRACTIONS	ADDITIONS
<div style="text-align: center;">Revenue</div> <hr/> <div style="text-align: center;">Expense</div> <hr/>	

Then, in applying the rule for debit and credit entries given in Chapter II, it should be recognized that a debit entry in an expense account is a subtraction from equities in the sense that it is first a subtraction from revenue, which in turn represents gross additions to equities.

It will doubtless occur to the student that all expense and revenue items might be grouped logically under one account, the expense items being listed in the left-hand column, the revenue items in the right-hand column. That is, expense and revenue accounts are really *one-column* accounts, minus equity items appearing in one case, and plus equity items in the other. The

net balance of such a composite account would represent the net change in the equities. The use of such an account will be discussed in a later chapter. When expense and revenue items are segregated in special accounts, however, the two-column arrangement is preserved in each distinct account for clerical convenience in making transfer entries.

The expense and revenue accounts may be subdivided for statistical purposes almost indefinitely. This is one of the points at which a system of accounts is capable of great extension. Each particular type of expense may be listed in a distinct account, and these accounts may be grouped under several main heads. Similarly the special revenue accounts in an enterprise like a railroad company, for example, may be very numerous. The classification of expense and revenue accounts is one of the most important questions arising in the construction of a system of accounts for some specific enterprise. For the present, however, it will be sufficient for the student to grasp the general principles underlying the construction of such accounts; and hence the detail questions of classification will not be discussed at this point. The A. B. Co., it will be assumed, uses but two such accounts, one for the expense items and one for revenues. This would be an inadequate system in practice for any but very simple situations.

An analysis of a few transactions involving expense and revenue items will show concretely the nature of such accounts and the method of making the entries. The A. B. Co., for example, sells goods for \$1,500, cash. This is an illustration of a revenue transaction. It would be recorded by a debit entry of \$1,500 in the Cash account — an addition to assets, and a credit entry of \$1,500 in the Revenue account — a gross addition to equities. If now it were possible to discover immediately the expenses involved in producing this item of revenue these expenses might be at once recorded and the amount of *net* revenue shown. Right-hand — or credit — entries would be made in the various asset accounts affected to represent the subtractions from assets, and left-hand — or debit — entries for the same amounts in the Expense account to represent the subtractions from revenue. If, for example, it is discovered that coal has been consumed to the amount of \$10, this situation would be recorded by a credit entry of \$10

in the Fuel account and a debit entry of \$10 in the Expense account.

In many cases a service or commodity purchased becomes an expense before it appears as an asset in the accounts. A purchase of postage stamps, for example, may be utilized entirely on the day of purchase and hence never exist *in the accounts* as an asset. If the amount were \$5 the transaction would then be recorded by a debit entry of \$5 directly in the Expense account, and a credit entry of the same amount in the Cash account. The item has passed on in the operation of the business and cannot now be considered an asset. In strict logic, however, these entries are really a summary of two independent happenings: (1) an exchange of assets — cash for stamps; (2) an expiration of an asset and a subtraction from revenue. If a complete record of this situation were made the entries would be as follows: (1) a debit entry in the Miscellaneous Assets account and a credit entry in the Cash account; and (2) a credit entry in the Miscellaneous Assets account and a debit entry in the Expense account. In practice, however, it would not be expedient to carry this analysis into the accounts.

Similarly, if the A. B. Co. hires laborers for a week and pays them \$150 in cash at the end of this period, these services do not exist as independent assets but have passed on in the business process before payment is made. Hence the transaction in practice would be recorded by a debit entry of \$150 in the Expense account and a credit entry of the same amount in the Cash account. But if wages or salaries are prepaid in any case for a considerable interval it should be recognized that the debit entries involved represent, not subtractions from revenue but additions to assets. The problem of classifying the accounts involved in these and similar situations will be further considered in a later section of this chapter.

#### SPECIAL EQUITY ACCOUNTS

In addition to the expense and revenue accounts several other types of supplementary equity accounts may be necessary, in the case of the typical enterprise, if the financial records are to show a reasonably complete statement of the changes in ownership due

to business operation. The net balance of the expense and revenue accounts is, as already noted, *net revenue* — or, if the enterprise has been unsuccessful, *net loss*. It is desirable in some cases to record this amount, after it is once determined, in a special account. Such an account, in the case of net revenue, represents the net increase in ownership during the period of operation under consideration; in the case of net loss such an account shows the decrease in the equities for the period. Entries in these accounts are made in exactly the same manner as are the entries in the balance sheet equity accounts already described. Items of net revenue are transferred to the credit column of the Net Revenue account; items of net loss are entered in the debit column of this account (or in the debit column of a distinct loss account).

It should be noticed that in addition to the balance from the expense and revenue accounts certain items of net loss and net gain may arise which require entries directly in special equity accounts. Suppose some unforeseen calamity results in the destruction of a portion of the assets of an enterprise. Such a happening constitutes a net subtraction from assets and hence a net subtraction from ownership. If, for statistical purposes, such items are set up under a special head the resulting account is a negative equity account, recording certain subtractions from the equities which for the time being are not deducted from the amounts appearing in the main equity accounts. Suppose, for example, coal to the value of \$100 is stolen. This transaction could be recorded by a credit entry of \$100 in the Fuel account and an equal debit entry in a special loss account. It is evident that such a subtraction from equities is quite distinct from an expense item — a subtraction from revenue. The ton of coal burned in the manufactory's furnace gives rise to an expense; although in a broad sense it is an exchange of one asset for another, for normally the proceeds from the sale of product will recoup the firm for all such expirations. But the ton of coal stolen is an actual loss, no valuable consideration being received in exchange; and hence such an item constitutes a net subtraction from the equities. It is not intended to elaborate at this point the importance of the distinction between a loss and an expense. For the present it is sufficient to note that the accounts

in either case are constructed as subsidiary equity accounts, and the entries are made according to the same rules.

Similarly, a donation, or any other accidental or extraordinary increase in assets, gives rise to an immediate net increase in equities; no expense deductions are involved in such an increase. If, for example, a factory site were donated to the A. B. Co. by an interested municipality, the transaction would be recorded by a debit entry in the Land account, as in the case of any asset increase, and a credit entry either in the A. B. Co. account or in some special *proprietary* account (for example, Surplus from Donations). Since proprietorship is the residual equity all special accounts in which actual losses or gains are recorded can be classed as subsidiary proprietary accounts.

Another occasion for the use of special equity accounts arises in connection with the distribution of net revenue among the various equities. In a partnership the partners' "personal" or "drawing" accounts are commonly used to record withdrawals from either income or original investment. If, for example, A, a partner in a certain enterprise, withdraws in cash net revenue amounting to \$500, the transaction would be recorded by a credit entry of \$500 in the Cash account and a debit entry of \$500 in the A, Personal account. In the incorporated enterprise, where such withdrawals take the form of *interest* and *dividends*, special accounts are necessary to record the payments — subtractions from equities — made to the various classes of security-holders. It will be assumed that the A. B. Co. makes use of two such accounts, Interest and A. B. Co., Current. The Interest account is to be used to record all accruals to the contractual equities — in this case represented by mortgages and notes; and it is the function of the A. B. Co., Current account to show all proprietary earnings and withdrawals. The relation between these special accounts and the Net Revenue account is shown in the exhibit at top of page 46.

If, then, \$1,050 (interest for six months) were paid to the holders of mortgages against the assets of the enterprise the transaction would be recorded by a credit entry of \$1,050 in the Cash account (a subtraction from an asset) and a debit entry of \$1,050 in the Interest account (a subtraction from an equity — net revenue). Similarly, if the proprietors decided to withdraw earnings amount-



## PRINCIPLES OF ACCOUNTING

SUBTRACTIONS	ADDITIONS
<div>Net Revenue</div> <hr/> <div>Interest</div> <hr/> <div>A. B. Co., Current</div> <hr/>	

ing to \$3,000 the transaction would be recorded by a credit entry of \$3,000 in the Cash account and a debit entry of the same amount in the A. B. Co., Current account. A great variety of simple and complex transactions involving additions to or subtractions from net revenue and its subsidiary heads may occur in business practice. Nevertheless the rules for making debit and credit entries as explained in Chapter II apply logically to all cases.

Special accounts are commonly used to show the accumulations of net proprietary revenue invested in the business. The Surplus account is used for this purpose. Such an account is simply a special proprietary account and is constructed in the same way as any other equity account. The term *deficit* is used to designate accumulated net loss, and the account in which such items are recorded is the Deficit account. The relation between the original proprietorship, Surplus and Deficit accounts can be shown thus :

SUBTRACTIONS	ADDITIONS
<div>A. B. Co.</div> <hr/> <div>Deficit</div> <hr/>	
	<div>Surplus</div> <hr/>

The Surplus account in practice may have a number of important subdivisions. The special loss and gain accounts mentioned above can be considered as examples of subsidiary deficit and surplus accounts, provided the amounts involved are treated as adjustments of original proprietorship rather than of net revenue. In Chapter XIII the various surplus accounts will be discussed in some detail.

One other group of equity accounts — those recording *current liabilities* — should be mentioned. In addition to liabilities such as ordinary accounts payable — which arise through the purchase of raw materials and other assets on credit — accrued items of wages, interest and taxes are sometimes set up in special accounts. All of these accounts are constructed as are the balance sheet equity accounts — the right-hand column being used for additions, the left-hand column for subtractions. Any firm which does not adopt a strictly cash basis for its business relations will require several such accounts. Specific examples will not be considered at this point, however, for the use of such accounts can be more conveniently explained in later chapters.

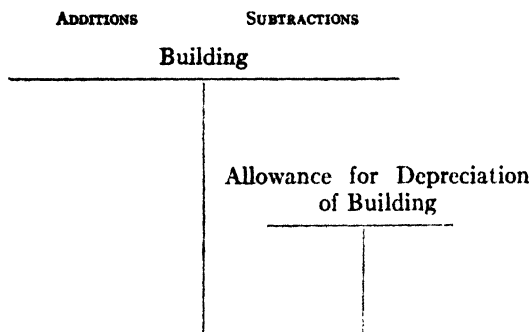
#### VALUATION ACCOUNTS

Almost any asset or equity account may have a subsidiary account. Whenever it is desired for some reason to take special cases of subtractions from either an asset or an equity item and place such subtractions under a special head, the new account simply represents a part of the main account, or is, in other words, subsidiary to the main account. Such accounts are usually called *valuation* accounts.

There are several reasons for the use of valuation accounts. In the case of a fixed asset, such as a building, it may be thought desirable to preserve in one account the original cost figures and to use a special account to show the subtractions from this asset which are due to business operation and the passage of time. Such an account may be called, Allowance for Depreciation of Building.<sup>1</sup> If, for example, it were discovered that the building of the A. B. Co. had declined in value during a certain period of

<sup>1</sup> Cf. Cole, *Accounts, Their Construction and Interpretation*.

operation, \$600, this transaction would be recorded by a right-hand entry of \$600 in the Allowance for Depreciation of Building account and a left-hand entry in the Expense account. The first entry represents the subtraction from the asset, but instead of being recorded directly in the Building account this subtraction is set up in a subsidiary valuation account; or, in other words, a credit entry in a valuation account is substituted for a credit in the asset account. The second entry represents the subtraction from revenue due to the expiration of this asset in business operation. The relation between the Building account and its subsidiary can be suggested thus :



Many cases of asset valuation accounts are met with in accounting practice. Since such accounts show credit balances they are sometimes confused with the equities. The importance of avoiding such a confusion can hardly be overemphasized, for there is clearly no relation between a positive equity balance and a subtraction from an asset. The use of such accounts and their significance in the accounting statements will be further discussed later in the text.

In connection with equity accounts which represent the securities of incorporated companies valuation accounts are frequently used. Securities are commonly maintained in the accounts at *par* — the nominal value. Since the actual amount of ownership represented by a security very often is more or less than the stated par value, subsidiary accounts are necessary to show the difference. Thus, capital stock may be issued at \$75 per share although the formal capitalization is \$100 per share.

If the Capital Stock account is used to record the par value, a valuation account, Discount on Stock, must be opened, in which is shown the amount of the discount. Such an account simply shows an offset to an overstated equity. The Deficit account mentioned in the preceding section is really a valuation account, its function being to show the accumulated net decrease in the proprietor's equity.

There is nothing about valuation accounts that invalidates the explanation of the double-entry system thus far outlined. Each valuation account is so constructed as to preserve the balance of the main account, be it an asset or an equity account, in the proper column. Such accounts are further illustration of the general scheme of using additional columns for minus items rather than making the actual subtractions; though in this case entirely distinct accounts are used for the negative items. The need in particular cases for preserving original figures in the accounts is the legitimate excuse for such a procedure.

In this section, as in the preceding, it is not feasible to do more than mention these special subsidiary accounts. Yet although an endeavor has been made to reduce the discussion to its simplest terms it has been impossible to avoid introducing certain expressions and concepts with which the student will not be entirely familiar until much later; as in many other subjects the student's mastery of ideas which are necessarily brought in at the beginning is not complete until the entire field has been covered. The way in which such special accounts fit into the general structure of the double-entry system has, however, been suggested; and it should appear fairly evident at this point that the general rules involved in the construction of a whole system of accounts — those representing the historical situation as well as those showing the financial condition of an enterprise at given moments of time — are essentially those stated in Chapter II. The fundamental consideration controlling the construction of the historical as well as the balance sheet accounts is the preservation of the classification, assets and equities. In all valuation and other subsidiary accounts, then, debit and credit entries have essentially the same possible meanings as in the main asset and equity accounts.

## THE CLASSIFICATION OF ACCOUNTS

The classification of accounts that has been presented thus far in the text has recognized only *pure* accounts — accounts, that is, which show in each case but one of the important classes of the balance sheet, or some phase, positive or negative, of one of these classes. In other words, each of the important accounting concepts — asset, equity, expense, revenue, etc. — has been attached to a *distinct* group of accounts. While this classification is of primary importance in that it furnishes a rational basis for the explanation of the essential nature of a system of double-entry accounts, it should now be recognized that no set of accounts in actual practice can be expected to follow such a grouping exactly. Brief consideration will be given at this point to some of the principal difficulties involved in account classification.<sup>1</sup>

As already noted, the current assets merge with the expense items at certain points; or, in other words, some outlays in business practice are of such a nature that they may be classed, with almost equal propriety, as either asset or expense items. Some commodities and services are so transitory in character as to constitute expense almost at the moment of purchase; that is, although any valuable item is logically an asset as purchased, it may become an expense shortly after — or even before — it is convenient to record it in the accounts. The cash purchase of advertising services, for example, may be conceived in the first instance as an exchange of assets; hence the entries involved may be said to represent an addition to one asset and a subtraction from another. If, then, the accounts affected are defined in terms of the logical classes involved in the transaction at the moment of purchase, it can be affirmed, with reason, that both accounts are *asset* accounts. On the other hand, if the payment made is for services covering a very short period, the transaction may logically be viewed, not from the moment of purchase but from the moment of expiration; and from this standpoint it can be said that the debit entry represents an expense — a deduction from revenue. If the accounts involved are now defined in terms of the logical classes existing at the moment

<sup>1</sup> "Account classification" means here, not detail classification for managerial purposes, but general classification in terms of fundamental concepts.

the item has expired, it may with reason be said that the account in which the left-hand item is recorded is an *expense* account. Or if payment is made concurrently with the expiration of the service — or later, then clearly the left-hand entry records an expense item, and the account affected is an expense account.

In accounting practice the accounts designated in this chapter as current asset accounts are often called expense accounts. This is no very serious error if it is recognized that all the items involved in such accounts are logically assets as purchased, and give rise to expense items only as consumed. As to whether or not such a practice is justified is largely a question as to the *normal* condition of such accounts during operation. If the Fuel account of the A. B. Co. at a given moment of time, for example, shows total debit entries of \$400, and an examination of the coal bins reveals the fact that of this total, fuel to the amount of \$350 has been consumed, then it is evident that of the \$400, but \$50 represents an asset, the balance being at this moment an expense. Both items belong logically in the left-hand column, but one is a positive asset figure, the other a deduction from revenue. If this situation represents a normal condition, the Fuel account may be defined from the standpoint of coal consumed rather than coal purchased.

A distinction, then, must sometimes be recognized between the logical nature of the *items* involved in a business transaction and the nature of the *accounts* which are used to record the transaction. An account may be defined or classified in terms of its predominating element, or, in other words, from the standpoint of the destination at the end of the accounting period of the principal sum involved in the account. Thus the purchase of assets may be recorded in an "expense" account, because at any given moment a very large proportion of the total amount shown in the account represents expense. Even in such a case, however, it is more rational to conceive of the account as a current asset account, and a debit entry as an addition to an asset, when the purpose of the classification is an explanation of the structure of a system of accounts and the logical rules for making debit and credit entries.

In a lesser degree the accounts which represent the more permanent assets of an enterprise present the same difficulties of

classification. The Building account, for example, may show at a particular moment a debit balance of \$70,000; but if an appraisal of the building reveals the fact that the present value is but \$69,000, the account at the moment of appraisal does not represent an asset alone. An element of expense is involved. And, since the depreciation of the building occurs continuously, it is not feasible to represent this fact continuously in the accounts. Hence, due to the impossibility of subtracting all expirations from the asset accounts as they occur, nearly all asset accounts, in practice, fail to represent continuously a single class of facts. Just as the Fuel account at a particular moment of time may represent coal consumed as well as coal on hand, so the Building account may show, not simply an asset item, but an item of expense as well.

Some accounts in practice become "mixed" in the sense that more than one element is specifically recorded in each account. Thus the Merchandise account as sometimes kept in the retail business is an asset, expense and revenue account combined. The left-hand column is used to record purchases of merchandise (the raw material of the enterprise); the right-hand column shows the sale of the finished product (in this case retailed merchandise). That is, one column represents an asset, and the other revenue — a gross addition to equities. As the raw material is consumed in operation the asset expires and becomes an expense. Similarly, in some cases the Rent account is used to record asset, equity, expense and revenue items. The practice of listing several elements in a single account can be carried very far; even the balance sheet itself can be conceived as an account showing all the assets and equities of the business. As long as the items involved are grouped in the proper columns, however, such mixed accounts can be used without confusion; and the rules for making debit and credit entries are the same for all such accounts as for pure accounts. The important cases of such involved accounts will be considered in some detail in later chapters, particularly in connection with the discussion of the closing of accounts.

The discussion has now been carried far enough to suggest the logical problems that arise in classifying accounts in actual practice. In conclusion it should be emphasized that no classifica-

tions of facts in any field of knowledge follow exact lines of cleavage. There are always connecting links, grounds of dubiety, points at which one class shades into another. But these difficulties do not destroy the value of classifications. Classifications are primarily for purposes of convenience; a particular grouping is adequate if it satisfactorily serves the purpose in hand. For some purposes distinctions may well be observed, for others similarities. Controversies concerning the legitimacy of this or that particular classification usually arise because one or more of the contending parties fail to appreciate the conflicting purposes involved. The importance of the purpose served in any case, however, determines the importance of the classification. In Chapter II and the present chapter, to repeat, accounts have been classified in terms of the important logical concepts with which accounting deals in order to furnish a rational basis to the interpretation of all possible business happenings for the purpose of making debit and credit entries.

The explanation of the nature of the principal types of supplementary accounts may be conveniently summarized by presenting the complete scheme of accounts for the A. B. Co. in its relation to the fundamental equation, thus:

THE A. B. Co.'s ACCOUNTS<sup>1</sup>

ASSETS		EQUITIES	
ADDITIONS	SUBTRACTIONS	SUBTRACTIONS	ADDITIONS
Land		A. B. Co.	
\$40,000			\$170,000
		Deficit	Surplus

<sup>1</sup> It must be remembered that this illustration is not intended as an exhaustive classification of the accounts likely to be used by any actual enterprise; it is rather designed merely to suggest the structure of the important *types* of accounts required by the typical enterprise. The illustrative transactions given in Chapter II as well as in the present chapter, in so far as these transactions affect the accounts of the A. B. Co., are recorded in the proper columns. No net revenue amounts



# PRINCIPLES OF ACCOUNTING

THE A. B. Co.'s ACCOUNTS (Continued)

ASSETS			EQUITIES	
ADDITIONS	SUBTRACTIONS		SUBTRACTIONS	ADDITIONS
Building			Mortgages	
\$70,000	Allowance for Depreciation of Buildings			\$35,000
		\$600		5,000
Equipment			Notes Payable	
\$20,000			\$1,000	\$20,000
4,000			5,000	5,000
				2,000
Materials			Revenue	
\$80,000				\$1,500
600			Expense	
			\$ 10	
			5	
			150	
			600	
Cash			Net Revenue	
\$15,000	\$ 600		Interest	
5,000	1,000		\$1,050	
1,500	2,000		A. B. Co., Current	
	60		\$3,000	
	5			
	150			
	1,050			
	3,000			

were assumed; hence there are no credit entries in the Net Revenue account although distributions of net revenue are shown.



## IV

### THE ANALYSIS AND RECORDING OF TRANSACTIONS

IN Chapters II and III the general principles underlying the structure of a system of double-entry accounts were explained, and the effect of the important types of transactions upon the individual accounts and the fundamental equation was shown. In this exposition, however, little reference was made to either the details or general features of bookkeeping procedure. It is the purpose of the present chapter to describe briefly the more significant forms of "books" which are used in double-entry bookkeeping, and to explain — with reference to these books — the main characteristics of the technical process of analyzing and recording accounting transactions.

#### THE BOOKS OF RECORD AND ACCOUNT

As a preliminary to a description of the principal books of record and account some further explanation of the term *transaction* should be made. Any happening which affects an asset or an equity item (or some phase of an asset or equity), or, in other words, any situation which gives rise to entries in the accounts of an enterprise, constitutes an accounting transaction.<sup>1</sup> The recording of transactions representing actual purchase and sale exchanges and the like usually constitutes the main part of the bookkeeper's routine work; and the forms and records employed in practice are specially constructed to facilitate the process of analyzing and recording "business" transactions. Nevertheless it should be remembered that changes in the assets

<sup>1</sup> Thus, "closing" and adjusting entries made at the end of an accounting period (see Chapter VIII), and transfer entries such as those covering the appropriations of the directors of an incorporated enterprise, can be said to represent transactions.

and equities of an enterprise which arise because of the conditions of operation itself must also be recorded in the accounts; the *consumption* of coal must be taken into consideration as well as the *purchase* of coal.<sup>1</sup> But, as was noted in the preceding chapter, such occurrences are usually recorded only at intervals — usually at the time of closing the accounts. For the purpose of describing bookkeeping forms and procedure it will therefore be convenient, at this stage, to depend for illustrative transactions largely upon actual business happenings.

As soon as a transaction is recognized as taking place an informal record, or memorandum, of the occurrence is usually made. In many cases some document or form — such as a bill, check or receipt — is made out in connection with the transaction. Such documents, collected in files, may be thought of as constituting — in the absence of a formal book — the book of original record. Or the original narrative of the various happenings may be jotted down in a bound or loose-leaf book; in which case such a book can be considered as representing the first formal record. The name *daybook* is often applied to the original record, particularly if a bound volume is used for this purpose.

A daybook, in its simplest form, contains merely a rough narrative of events — often written in pencil — with no specific reference to accounts or to debit and credit entries. In such a case a section of a daybook page would appear somewhat as follows:

#### January 2

Bought for cash 10 tons soft coal from Keck & Son @ \$6. Amount, \$60. For immediate delivery.

Hardware supplies — as per itemized bill of this date — were received from the Essex Mfg. Co. Total amount, \$600. A check for this amount was made out and mailed.

#### 3

Borrowed \$5,000 from the First National Bank on our 60-day note at 6%. This amount was deposited to the credit of our checking account.

<sup>1</sup> Strictly speaking, transactions which occur in time, such as the expiration of a fixed asset due to deterioration and other factors, are infinite in number. Since it is impracticable and even impossible to make a record of these transactions as they occur, transactions as recognized in the accounts can be conceived as including, in many cases, innumerable subsidiary happenings.

It is evident that the details of each transaction as recorded in such a book can be made as exhaustive or as meagre as may be desired in any case.

Accounting analysis and record proper, however, do not begin with the daybook as it has just been described. In the double-entry system the two books of fundamental importance used in recording business transactions are the *journal* and the *ledger*. A daybook and many other supplementary forms and auxiliary records may be necessary — particularly in the case of an enterprise with a complex organization and a long and involved productive process; but in any case the fundamental books of the double-entry system are the two just mentioned. The accounting analysis and recording of transactions can best be described in terms of these books.

The first essential step is the classification of each transaction as it occurs into debit and credit items. This process of analysis is commonly spoken of as “journalizing” because of the practice of recording the debit and credit classification of data first in the journal. In this sense the journal is the book of “original entry.” The journal may be a bound volume with the simple page form shown in the following section, or it may be a complex book, or series of books and forms, as will be explained in Chapter V. The particular form of the journal is not an essential element in its definition; the journal is the book, form, or forms in which are first recorded the debit and credit items involved in the transactions that occur. Where the daybook, so called, is used to designate debit and credit entries, it virtually becomes a journal.

Further, the debit and credit items, once ascertained, must be listed in compact form in the left-hand and right-hand columns of the proper accounts. The ledger is the book of the accounts. The simple form of the ledger is also the bound volume, but other forms are possible. The ledger also may be a series of books or forms as will be shown in the following chapter.

The use of two fundamental books in recording business transactions is somewhat arbitrary. Each transaction must be analyzed into debit and credit items and these items must be entered in accounts, as explained in Chapter II, if the double-entry device is to be employed. The use of two books in this process instead of one, however, is largely a matter of clerical conven-

ience, and there is some tendency in bookkeeping technique to reduce the financial books proper to simply the books of account. Yet however technique may develop the essentials of the process must remain the same: (1) each transaction must be classified into debit and credit items; (2) these debits and credits must be actually carried to the accounts affected. If but one book is used this book constitutes both journal and ledger. Throughout the text the separation of the two steps will be maintained, and the device of the simple journal entry will be used as a representation of the process of debit and credit analysis. A more detailed description of these important books will now be given.

### THE JOURNAL

The journal, as stated above, is the book of original entry. As ordinarily used it can be said to have two functions: first, it furnishes a record of the classification of transactions into debit and credit items; second, it gives brief details in connection with each transaction. No other formal book for recording the original narrative is then necessary, although the journal record is usually transcribed at regular intervals from rough memoranda, underlying papers, or a daybook. The simple journal is a bound volume with numbered pages. A section of a page from such a journal would appear somewhat as the table at top of page 60.

The left of the two columns at the right of the page is the column in which are listed the debit amounts; the right-hand column is for credit items. The name of each account is given a single line; in this way the details or explanations are not likely to be confused with the account titles in the process of transferring the amounts to the ledger. The debit accounts are first stated in each case. This is the conventional arrangement. The name of the account which is to be credited is indented to the right. Where several debit or credit accounts are involved in a single transaction it is desirable to follow the conventional form, listing first all debit accounts — a separate line for each account — and then all credit accounts. In the column at the left of the page are given the ledger page numbers of the various accounts involved. These ledger page numbers should always be given in the journal to facilitate the comparison of the two

L. F.		January 2		
28		Materials	\$ 600	
7		Cash		\$ 600
		Bought for cash from the Essex Mfg. Co. materials as per itemized bill of this date.		
7		Cash	5,000	
32		Notes Payable		5,000
		Borrowed \$5,000 from the First National Bank on our 60-day note at 6%.		
		3		
11		Equipment	4,000	
7		Cash		2,000
32		Notes Payable		2,000
		Additional equipment was purchased from the Bur- gan Supply Co. for cash and note.		
15		Fuel	60	
7		Cash		60
		Bought for cash 10 tons soft coal @ \$6.		
7		Cash	1,000	
46		Revenue		1,000
		Finished goods sold for cash to H. J. Harvey as per invoice of this date.		

books whenever need for such comparison arises; and these numbers also serve as a check on the accuracy of the bookkeeper's work in transferring items from the journal to the ledger.

The process of entering a debit item in the journal is usually called "charging": to debit an account is to charge an account. Entering credit or right-hand items is called "crediting." In making journal entries the words *to* or *by* are often used, thus:

Fuel . . . . .	\$60	
<i>to</i> Cash . . . . .		\$60

The use of the preposition serves no purpose except to indicate further which item is a debit and which a credit. Indeed such terms are likely to be more confusing than helpful. There is no time or other sequence between the debit and credit items in-

volved in a transaction. The conventional method of indenting the credit accounts to the right, as shown above, suggests the spatial arrangement of debits and credits and is probably the most satisfactory of all devices. If this is done there is no need of further explanation.

The importance of the journal when considered as representing the primary debit and credit analysis of the transactions is evident. The structure of the double-entry system depends upon a debit and credit classification of items. Such a classification is the first essential step in interpreting accounting data, and the use of parallel-column accounts, as shown in Chapter II, is impossible without this analysis. Further, an orderly statement of the important details connected with each transaction is very necessary for future reference in case of misunderstandings, audits, legal complications or other contingencies. For this reason it is desirable that the journal narrative give a rather full explanation of each transaction, instead of a very much abbreviated statement.

As stated above, many of the original details may be recorded in other books and forms than the journal proper. Notes payable and notes receivable *registers* may be kept, for example, in which are recorded the details in connection with these types of commercial paper. Various other kinds of memoranda are used in keeping the record of original data; and, of course, original documents such as receipts, vouchers, bills of lading, etc., are to a great extent preserved and kept on file to supplement the books proper. From the standpoint of authenticity in legal and other disputes these underlying papers naturally carry more weight than the journal. As far as the formal books are concerned, however, the journal, as stated above, is the book of original entry.

The journal itself is often subdivided into a number of special books. The *cash book*, the *purchase book* and the *sales book* are the common examples of such special journals. The names of these books suggest their nature. The use of these additional books is of advantage in economizing clerical effort; and they also serve to isolate in the accounts each department or phase of the business. These and other modifications of the simple journal will be described in Chapter V.



## THE LEDGER

The ledger, as explained above, is the book of final account. It is the book of the accounts proper, representing the organization of the debits and credits of the journal into compact form and allocated to the various accounts affected by the transactions. The difference between the journal and ledger in regard to the organization of data may be expressed in this way: in the journal the unit is the *transaction*; in the ledger the unit is the *account*.

The simple form of the ledger is also a bound volume, although innumerable variations are possible. Each account may be given a single page, or more or less than a page according as it is expected that there will be a large or small number of transactions affecting the account. The accounts are commonly arranged alphabetically rather than in logical groups, because this arrangement can be more readily used for reference purposes.

The conventional ledger account has, roughly, the following form:

CASH					
1918			1918		
Jan. 2	J1	\$15,000	Jan. 2	J3	\$ 600
4	J4	500	3	J4	1,000
5	J5	1,250	3	J4	2,000
			4	J4	60
			5	J5	5
			5	J5	150

Usually, as in the above case, the ledger contains simply the heading or name of the account, the date of each entry, the journal page on which may be found the original entry, and the amount. Sometimes the name of the account that contains the concurrent opposite entry is written in. There are not many cases in which this is necessary, for if the journal page is given the details of the transaction giving rise to a particular ledger

entry can be readily ascertained. It is the particular function of the ledger to summarize the transactions in connection with each account so that conclusions concerning the status of each account may be drawn. Or, in other words, it is the function of the ledger to show under each account heading all plus and minus items — opposite tendencies — pertaining to that account, so that a *balance* can readily be taken.

The ledger, like the journal, may be divided into a number of special books, and the extent to which it is expedient to carry this subdivision depends upon the nature of the enterprise in any case. The most common examples of such specialized ledgers are: the *expense* ledger, often containing current asset accounts as well as pure expense accounts; the *creditors'* ledger, containing the "accounts payable" (a separate account for each person or firm); and the *customers'* ledger, embracing the "accounts receivable" (a separate account with each individual or firm). The cash book, which, as stated in the preceding section, is primarily a journal of transactions involving cash, may also be used as a ledger containing the single account, Cash. The *general* ledger includes all the accounts not contained in the special ledgers and *controlling* or summary accounts of the special ledgers as well.

The accounts payable of the creditors' ledger represent current obligations of the firm — usually obligations incurred through the purchase of raw materials, merchandise and other supplies on credit. Because credit purchases are the usual thing in many lines of business, the number of transactions to be recorded in these accounts is often very large. Such accounts, evidently, represent current equities in the enterprise. The time allowed on credit purchases is usually either thirty or sixty days. The goods so purchased represent assets as received, and should be recorded as such. Since payment for these assets is postponed, current equities for the same amounts (represented usually by the names of the firms from whom the purchases are made) must also appear in the records.

Similarly, the accounts receivable of the customers' ledger represent current claims which the enterprise has against other firms and individuals — claims usually arising from the sale of finished product on credit. Illustrative transactions affecting

these accounts and the accounts payable as well will be given in the following section.

The possibility of using controlling accounts for the special ledgers was mentioned above. A controlling account is of advantage in cases where detailed information is necessary for one purpose and summary information for another. For example, the sales manager may desire to determine at a glance the amount of outstanding customers' accounts. Hence the general ledger should include an Accounts Receivable, which is a controlling or summary account of the customers' ledger. Similarly, there should be a controlling account, Accounts Payable, for the creditors' ledger. The use of controlling accounts makes it possible to have in the general ledger a complete representation of the business. Conclusions concerning the status of the enterprise at any time can then be drawn from one book. The controlling account device may be carried very far in practice. In some cases each general ledger account "controls" several subsidiary accounts.

The nature and use of the special ledgers will be further explained in a later chapter. The clerical advantage of such books, and of controlling accounts, depends largely upon the device of the special-column journal, which will be described in some detail in Chapter V.

#### JOURNALIZING

As has been stated, it is one function of the journal to present a classification of transactions in debit and credit, or left-hand and right-hand, entries. Thus it is apparent that *journalizing* involves more than the mere recording of facts. The first, and a very important, step in interpretation is taken in the process of grouping debits and credits. Whenever both balance sheet classes are involved, this classification makes the fundamental distinction between asset and equity items. If the bookkeeper is handed a memorandum on which are given the details of the transaction and the names of the accounts involved, and on which it is already indicated for him which entries are debits and which are credits, then journalizing from that point is mere copying or recording, for the important process has already been completed.

The fundamentals of journalizing have already been brought out in explaining the structure of the accounts and the underlying principles for making debit and credit entries. This classifying of transactions into debit and credit accounts is of primary importance, and is a matter which presents considerable difficulty to the beginner. The classification of transactions given in Chapter II will therefore be repeated, and some additional illustrative cases will be analyzed. Although the second function of the journal mentioned above — the showing of the important details in connection with each transaction — is of importance, it presents no difficulty and will be ignored in the following discussion of journal entries.

a. Transactions occur which involve the exchange of valuable commodities or services for other commodities or services of equal value. In such cases a debit entry always means an addition to an asset, and a credit entry always indicates a subtraction from an asset.

### *Examples*

1. The A. B. Co. loans \$500 to A (one of the proprietors) in exchange for his sixty-day note at six per cent. What would be the journal entries in this case? One asset, cash, has been decreased to the amount of \$500, and another asset, notes receivable (a right against A in this case), has been increased a like amount. The journal entries would therefore be:

Notes Receivable . . . . .	\$500	
Cash . . . . .		\$500

2. Materials to the amount of \$2,000 are bought for cash from Rankin & Co. This means a subtraction from cash of \$2,000 and an addition to another asset, materials, of the same amount. The transaction would accordingly be journalized by a debit, or charge, to Materials and a credit to Cash, thus:

Materials . . . . .	\$2,000	
Cash . . . . .		\$2,000

3. The equipment is insured for \$24,000 for three years. The premium of \$240 is paid in cash. This transaction represents the purchase of a service for cash. Protection from certain pos-

sible losses is secured for a period of three years, and payment is made in advance. The insurance premium in this case represents an asset charge; a right — covering a period of three years — is secured. As this right expires, it will constitute expense. The situation is analogous to the purchase of a machine for \$240, which, it is expected, will last three years. At the moment of purchase the entire amount is an asset charge; as the machine depreciates the amount should be transferred to an expense account.

This transaction would therefore be journalized by a left-hand or debit entry to Insurance and a right-hand or credit entry to Cash:

Insurance . . . . .	\$240	
Cash . . . . .		\$240

Many similar transactions involving the purchase of services and rights covering a considerable period are met with in business practice. All such transactions should be analyzed in the same manner as this case.

4. The A. B. Co. agrees to purchase delivery equipment amounting to \$300 from Rankin & Co. provided the latter firm will accept in payment a return of unused raw material amounting to \$300 (cost price). This agreement is carried out. The journal entries would be:

Equipment . . . . .	\$300	
Materials . . . . .		\$300

Such barter transactions — particularly those which do not involve either expense or revenue items — are very exceptional under modern business conditions.

5. It is estimated that raw material to the amount of \$700 has been taken from the store room and is now in the factory in the form of semi-finished goods. This situation may be recognized in the accounts by the following entries:

Goods in Process . . . . .	\$700	
Materials . . . . .		\$700

Such transactions are of common occurrence in the accounts of manufacturing enterprises. Three accounts — or groups of

accounts — corresponding to the important stages in the manufacturing process are usually adopted. These accounts are: Materials; Goods in Process; Finished Goods. At intervals the changes in form which some of the assets are undergoing are recorded in these accounts. All such transactions may be conceived as internal transpositions of assets; in each case there is no connection with any outside firm or individual.

6. The Y. Co. settles an open account for \$1,000 in favor of the A. B. Co. with its sixty-day note at six per cent. This transaction involves — on the books of the A. B. Co. — a subtraction from accounts receivable and an equal addition to notes receivable. The journal entries would therefore be:

Notes Receivable . . . . .	\$1,000	
Accounts Receivable . . . . .		\$1,000
(The Y. Co.)		

This accounting procedure recognizes the legal and commercial distinction between open book accounts and promissory notes. The accounts now show that the Y. Co. no longer owes the A. B. Co. on the basis of a bill of goods, but on a promissory note; the open account is cancelled, and is replaced by a new asset — a new right against the Y. Co. Such transactions are of quite common occurrence.

7. Another illustration of the transposition of assets is found in the case where an enterprise sets aside cash, or other liquid assets, as a fund to be used for some special purpose. The term "sinking fund" is often applied in this connection. The A. B. Co., for example, decides to deposit \$1,000 each year with a trustee, in order to accumulate a fund of liquid assets sufficient to meet a certain mortgage at maturity. The journal entries covering such a deposit would appear as follows:

Sinking Fund Assets . . . . .	\$1,000	
Cash . . . . .		\$1,000

The intricacies of the sinking fund cannot be discussed at this point, but it should be clear to the student that such a transaction as this represents an exchange of assets.

All transactions which involve simply asset exchanges are entered in the journal according to the same principles of analysis

that govern the treatment of the above cases. Such transactions affect only one member of the fundamental equation, as was pointed out in Chapter II. Hence the problem of interpretation involved in making journal entries for these cases is simply that of distinguishing between additions to and subtractions from assets, and selecting the accounts affected. It is worth noticing that the Cash account is involved in the majority of such cases. Cash, being the only legal tender, is the only asset possessed by a given enterprise which it can readily exchange for other assets.

b. Transactions frequently occur which represent an increase or decrease in assets and an equal increase or decrease in equities. The complete rule for making debit and credit entries is necessary to cover all such cases: debit indicates an addition to assets or a subtraction from equities; credit indicates a subtraction from assets or an addition to equities. Further, it must be remembered that an addition to equities may be a net addition or a gross addition (revenue), and that a subtraction from equities may be made directly through some equity account, or as a subtraction from revenue — an expense charge.

### *Examples*

1. Notes of the A. B. Co. are retired with cash, \$5,000. In this case an equity is reduced \$5,000 and there is a corresponding reduction in an asset, cash. The transaction would be journalized by a debit to Notes Payable and a credit to Cash, thus:

Notes Payable . . . . .	\$5,000	
Cash . . . . .		\$5,000

2. Materials are bought on account from Rankin & Co. to the amount of \$1,200. An asset, materials, has been increased, and a liability, accounts payable, has been increased an equal amount. The entries would then be:

Materials . . . . .	\$1,200	
Accounts Payable . . . . .		\$1,200
(Rankin & Co.)		

If these materials had been purchased with a note, the only difference in the entries would be that another equity account, Notes Payable, would be credited instead of Accounts Payable.

3. It is decided that \$150 represents a month's accrued depreciation on the A. B. Co.'s building, and the bookkeeper is asked to recognize this fact in the accounts. This transaction involves a subtraction from an asset, building, of \$150, and an equal subtraction from revenue through the Expense account. The journal entries would appear as follows:

Expense . . . . .	\$150	
Building <sup>1</sup> . . . . .		\$150

4. The A. B. Co. needs additional capital; and a new mortgage on real estate is issued, \$5,000. This transaction means an addition to an asset, cash, and an equal addition to an equity, mortgages. Accordingly the entries would be:

Cash . . . . .	\$5,000	
Mortgages . . . . .		\$5,000

5. The month's consumption of coal is \$100. This transaction would be recorded by a credit to Fuel (indicating the subtraction from an asset) and an equal debit to Expense (indicating the subtraction from revenue), thus:

Expense . . . . .	\$100	
Fuel . . . . .		\$100

All transactions involving expirations of assets in operation are journalized according to this analysis.

6. The weekly payroll is met with cash, \$500. The journal entries would be as follows:

Expense . . . . .	\$500	
Cash . . . . .		\$500

This transaction illustrates the use of a direct charge to Expense for services purchased instead of to an asset account. If a special expense account, Labor, were used, the entries would be:

Labor . . . . .	\$500	
Cash . . . . .		\$500

<sup>1</sup> The valuation account, Allowance for Depreciation of Buildings, would often be credited instead of Building.



7. The following bills are received : light, \$12 ; telephone, \$8 ; freight and cartage, \$50. Checks are drawn and mailed for the amount of these bills. This transaction would be journalized :

Expense . . . . .	\$70	
Cash . . . . .		\$70

A special expense account might also be used for each of these items. Nearly all small amounts of this kind are charged directly to an expense account even if payment is made before the receipt of the commodity or service involved. Such items are transitory in character and are usually viewed from the standpoint of their destination in the accounts.

8. Finished goods are sold for cash, \$500. An asset, cash, is increased, and revenue is increased a like amount. The transaction would therefore be journalized as follows :

Cash . . . . .	\$500	
Revenue . . . . .		\$500

In practice the Revenue account is often called the "Sales" account.

9. The A. B. Co. rents a portion of its building for \$50 per month. A month's rent is received. This transaction also represents an addition to an asset and an equal addition to revenue. In this case the revenue arises in connection with the performance of an ancillary service. The entries for this transaction would appear as follows :

Cash . . . . .	\$50	
Revenue . . . . .		\$50

For statistical purposes a special revenue account, Rent, might be used.

10. The firm is credited with interest on its bank balance, \$40. This is another revenue transaction. Since the item of revenue is net in this case, however, the Net Revenue account should be credited, thus :

Cash . . . . .	\$40	
Net Revenue . . . . .		\$40

Or a special account, Interest Received, may be credited, thus :

Cash . . . . .	\$40	
Interest Received . . . . .		\$40

11. The firm pays interest on outstanding mortgages, \$400. This transaction is essentially the reverse of the preceding illustration; it represents a subtraction from an asset, cash, and an equal subtraction from an equity, net revenue. The journal entries would be :

Net Revenue . . . . .	\$400	
Cash . . . . .		\$400

Or a special account, Interest Paid, may be debited, thus :

Interest Paid . . . . .	\$400	
Cash . . . . .		\$400

12. The firm sells goods on account to H. A. Wilcox, \$150. This transaction represents an increase in an asset and an equal increase in revenue. Accordingly the entries would be :

Accounts Receivable . . . . .	\$150	
(H. A. Wilcox)		
Sales . . . . .		\$150

According to the terms of the sale, it will be assumed, the buyer is to be allowed a two per cent discount if the bill is paid within ten days. The bill is paid and the discount is allowed. This transaction would be journalized as follows :

Cash . . . . .	\$147	
Sales Discounts . . . . .	3	
Accounts Receivable . . . . .		\$150
(H. A. Wilcox)		

This transaction illustrates the general practice of allowing cash and trade discounts, and other rebates and allowances, in commercial transactions. The usual bill of purchase or sale contains alternative terms of settlement. If cash is paid within a certain specified time it is customary to allow a discount on the gross price. In this case the amount of the discount is \$3. This item represents a subtraction from the amount credited to the

Sales account in the preceding entry. Sales Discounts is therefore a valuation account, showing subtractions from an overstated revenue. The amount of the discount might logically have been charged directly to Sales.

13. To illustrate transactions involving purchase discounts it might be assumed that Rankin & Co. offer a discount of two per cent on the bill mentioned in (2) above. If the discount is accepted by the buyer the entries when the account is paid would appear as follows:

Accounts Payable . . . . .	\$1,200	.
(Rankin & Co.)		
Cash . . . . .		\$1,176
Purchase Discounts . . . . .		24

Purchase Discounts is another valuation account and the amount shown by such an account is a deduction from the cost of materials and supplies which have been entered at the gross rather than the actual price. A discount accepted on goods purchased and entered at a gross price might therefore be logically credited directly to the asset account in question.

Valuation accounts of this kind are very common in accounting practice, and some difficult problems of analysis arise in connection with such accounts.<sup>1</sup> A further discussion of transactions involving adjustments of costs and revenues will be given in a later chapter.

14. An actual loss or gain represents a transaction which affects both members of the fundamental equation directly. An officer of the A. B. Co. embezzles cash amounting to \$1,500. The following entries would be a recognition of this occurrence in the accounts:

Surplus . . . . .	\$1,500	
Cash . . . . .		\$1,500

Since this defalcation represents a net decrease in assets with no compensating advantages it also constitutes a net subtraction from proprietorship. If there be no Surplus account in a given case, a charge should be made to the original proprietorship account, or to some valuation account such as Deficit.

<sup>1</sup> See Appendix A.

The opposite of this transaction would be an extraordinary gain, such as a gift. Transactions involving actual loss and gain are not of very common occurrence in the typical business enterprise.

The above cases are typical of the situations which give rise to entries affecting both the asset and equity classes. In interpreting transactions of this type it should be constantly kept in mind that the expense and revenue and other supplementary accounts involved can only be understood in view of their relation to the balance sheet accounts. The Revenue account is credited with all sales of product, for revenue represents gross additions to the balance sheet equities. Expense accounts are charged with all commodities and services consumed because these expirations constitute subtractions from revenue.

c. Transactions may occur which affect only the equities — the right-hand member of the fundamental equation. One equity may be increased and another decreased a like amount. The exchange of notes and accounts payable gives a simple illustration. The A. B. Co. gives its sixty-day note at six per cent for \$1,000 to cover an open account in favor of Rankin & Co. of the same amount. The entries would accordingly be :

Accounts Payable . . . . .	\$1,000
(Rankin & Co.)	
Notes Payable . . . . .	\$1,000

This transaction involves a subtraction from one equity, accounts payable, of \$1,000, and an equal addition to another equity, notes payable. In each case it is Rankin & Co. that has the claim against the A. B. Co., but this claim now is represented by a promissory note instead of by a book account.

Such transactions are of quite common occurrence — particularly in the case of incorporated enterprises.<sup>1</sup> A large number of the transfer entries made in the process of closing the accounts fall under this head. It will be desirable to postpone

<sup>1</sup> The refunding of securities; the division of surplus into a variety of forms (such as the declaration of dividends); the exchange of securities for other equities (e.g. the funding of a floating debt of general creditors' accounts into bonds or other securities): all these operations involve merely the exchange of equities, and do not affect the asset accounts.

the discussion of further illustrations until later chapters, however, since such transactions are largely restricted to the period of closing and to the corporate form of organization.

d. A great many business happenings represent combinations of the above types of transactions.

### *Examples*

1. A machine which cost \$200, and has been carried on the books at that figure, is sold for \$150. This transaction involves an addition to assets of \$150, a subtraction from revenue of \$50 and a reduction in assets of \$200. The entries, therefore, would be as follows :

Cash . . . . .	\$150	
Expense . . . . .	50	
Equipment . . . . .		\$200

2. The firm buys supplies from Rankin & Co. amounting to \$400. In making payment the firm transfers to Rankin & Co. an account which it holds against H. A. Wilcox, \$50, gives its thirty-day note at six per cent for \$100, and pays the balance in cash. In this transaction one asset, cash, is decreased \$250, another asset, accounts receivable, is reduced by \$50, an equity, notes payable, is increased \$100, and an asset, supplies, is received amounting to \$400. The entries would be :

Supplies . . . . .	\$400	
Cash . . . . .		\$250
Notes Payable . . . . .		100
Accounts Receivable . . . . .		50
(H. A. Wilcox)		

Although such transactions may be quite complex no new principles of analysis are required for such cases.

All possible transactions are covered by the above classification. An application of this analysis to other transactions will be made in succeeding chapters. It should be emphasized again that journalizing represents a highly important step in interpretation, for this is the process which classifies transactions into debit and credit entries.

## POSTING

The process of transferring items from the journal to the ledger is known as *posting*. It is purely a clerical matter. Once a transaction has been journalized the debit and credit classification is made. Posting, then, consists simply in the allocation of all debits as indicated by the journal to the left-hand column of the proper ledger accounts and all credits to the right-hand column of the proper accounts.

For an illustration of the process of posting it will be convenient to refer to the Cash account shown on page 62. The first credit entry, \$600, under date of January 2, was posted from page 3 of the journal (as indicated by the J<sub>3</sub>). The original entry which, it may be assumed, corresponds to this posting is shown in the section of a journal page on page 60. The figure 7 appearing in the column at the left of the journal page indicates the ledger page on which is found the Cash account. The \$600 item in the debit journal column is posted to the debit side of the Materials account which is found on ledger page 28. The ledger pages noted in the journal and the journal pages listed concurrently in the ledger accounts serve as a check for the bookkeeper to indicate which transactions have been posted and to correlate the two books for future reference.

In connection with controlling accounts such as Accounts Payable and Accounts Receivable the amounts affected must be posted twice — first to the controlling account, and second to the special creditor's or customer's account as the case may be. In the last transaction shown above, for example, Accounts Receivable was credited with \$50. In posting this transaction it would be necessary not only to enter an item of \$50 in the right-hand column of Accounts Receivable — the controlling account, but to carry the same amount to the credit of the H. A. Wilcox account. This is an apparent exception to the principle that in every transaction the debit entries involved equal the credit entries. In reality it is no such exception; for this situation simply means that certain information is posted in duplicate. The labor of posting in such cases is very much reduced by the use of the special-column journal.

If all the transactions are correctly posted the ledger columns

exactly represent the debit and credit classification of the journal, and the total of all debit items equals the total of all credit entries. In other words the opposite columns of the ledger are in balance. This applies only to the general ledger, for obviously if any journal item is posted to two ledgers the equality of columns — including both books — is not maintained.

Where the journal is of the simple form described in this chapter — having but two columns, one for debits and one for credits — posting is obviously a tedious process. Each entry must be taken separately; for every debit in the journal there must be a debit item posted to some ledger account, and for every credit journal entry there must be a separate credit posting. And where controlling accounts are used there are two debits or two credits as the case may be. To reduce the clerical work involved in this process is one of the main reasons for the development of the technique of bookkeeping, and some very ingenious special forms have been devised to eliminate a part of this clerical labor. In the following chapter the way in which the process of posting can be abridged by the use of special forms will be explained.

## V

### DEVELOPMENTS IN TECHNIQUE

THE simple forms of journal and ledger described in the last chapter have been supplemented in large measure by improved types of records. These books are not sufficiently specialized to cover the various phases of a large business and to allow a large staff of bookkeepers to work on them. Further, the process of posting from the simple journal is laborious and much time and effort may be saved by the newer forms. These developments in the technique of double-entry do not in any way change the principles of debit and credit already explained. All transactions must be recorded in some form of record and analyzed into debit and credit items, and a tabulation must finally be made of the debits and credits by ledger accounts. The detail process of effecting these purposes, however, may vary according to the conditions within the enterprise. Some of the more common of the modern forms will be described in this chapter.

#### THE SPECIAL-COLUMN JOURNAL

A very simple modification of the older type of journal, but one which effects a great saving in the labor of posting, is the special-column journal. In such a journal the debit and credit columns of the simple journal are subdivided and headed with the names of special accounts. The items in these special columns are posted in total rather than individually. Cash, for example, is an account which is debited and credited frequently in connection with current transactions. The posting process may be abridged through the use of two special columns for this account — one for debit entries, and one for credit entries. Two postings will then serve to transfer all the cash entries to the ledger.

This in brief is the principle of the special-column journal. The following illustration of one type of special-column journal shows the method of entry and of posting.<sup>1</sup>

<sup>1</sup> Explanations follow the entries for the first two transactions but are omitted thereafter. The student can readily assume transactions which might give rise to the remaining entries.



DEBIT COLUMNS						CREDIT COLUMNS						
AC- COUNTS PAYABLE	AC- COUNTS RECEIV- ABLE	MDSE.	CASH	SUN- DRIES	L F	S L F		SUN- DRIES	CASH	SALES	AC- COUNTS RECEIV- ABLE	AC- COUNTS PAYABLE
			40,000		✓ 1		Cash Jan. 2 John Reed, Proprietor Investment of cash in retail business	40,000				
				15,000	2		Real Estate Building					
				20,000	3		Cash		35,000			
					✓		Purchased bldg. and lot at 35 West St.					
		6,000			✓	6	Merchandise The Artland Co.					6,000
				3,000	4	2	Furniture and Fixtures The Crane Co.					3,000
				100	5	3	Advertising Cash		100			
			30		✓		Cash					
					✓		Sales			30		
	50				✓	4	J. R. Kerwin Sales			50		
		500			✓	6	Merchandise The Artland Co.					500
			40,030	38,100			Forward to page 2	40,000	35,100	80		9,500

DEBIT COLUMNS					CREDIT COLUMNS							
AC- COUNTS PAYABLE	AC- COUNTS RECEIV- ABLE	MDSE.	CASH	SUN- DRIES	L F	S L F		SUN- DRIES	CASH	SALES	AC- COUNTS RECEIV- ABLE	AC- COUNTS PAYABLE
	50	6,500	40,030	38,100			Forwarded from page 1 Jan. 6	40,000	35,100	80		9,500
			60		✓		Cash					
				215	✓	6	Insurance			60		
				50	✓	7	Salaries		215			
					✓		Cash		50			
		300			✓	8	Merchandise					
					✓		The Cutlery Co.			180		300
			180		✓		Cash					
					✓		Sales					
	15				✓	16	Geo. Otto					
	30				✓	35	John Quincy					
					✓		Sales			45		
					✓							
			6,000		✓	11	Cash	6,000				
					✓	8	Mortgage Payable					
					✓	13	The Artland Co.					
6,000					✓	6	Cash		5,880			
					✓		Discount	120				
					✓	9	Cash					
			150		✓		Sales			150		
					✓		Forward to page 3			515		
6,000	95	6,800	46,420	38,365				46,120	41,245			9,800

DEBIT COLUMNS					CREDIT COLUMNS							
AC- COUNTS PAYABLE	AC- COUNTS RECEIV- ABLE	MDSE.	CASH	SUN- DRIES	L F	S L F		SUN- DRIES	CASH	SALES	AC- COUNTS RECEIV- ABLE	AC- COUNTS PAYABLE
6,000	95	6,800 450	46,420	38,365	✓ ✓	10	Forwarded from page 2 Merchandise Brainerd Mfg. Co. Jan. 15	46,120	41,245	515		9,800
			65		✓ ✓ ✓	4 16	Cash J. R. Kerwin Geo. Otto				50 15	450
500					✓ ✓	6	The Artland Co. Cash Discount	10	490			
			1,000		✓ ✓	9 11	Cash Notes Payable	1,000				275
		275			✓ ✓	10	Merchandise Brainerd Mfg. Co.					
				50	12 ✓		Fuel Cash		50			
6,500	95	7,525	47,485	6,500 95 7,525 47,485	13 14 15 16		Column total Accounts Payable Accounts Receivable Merchandise Cash	41,785	41,785	515		
					16 17		Column total Cash Sales	515 65				
					14 13		Column total Accounts Receivable Accounts Payable	65		515	65	10,525
				100,020			Column total	100,020				

Special debit columns are maintained in this illustration for Cash, Merchandise, Accounts Receivable and Accounts Payable, and special credit columns for Cash, Sales, Accounts Receivable and Accounts Payable. Whenever a transaction requires an entry to one of these accounts, the amount is entered in the appropriate special column. When entries must be made to other accounts, the amount is entered in the "sundries" debit or "sundries" credit column as the case may be. These columns are posted item by item in the manner described in the preceding chapter.

An explanation of a few of the illustrative entries shown above will serve to explain the nature and use of this journal. The first pair of entries shows the investment of \$40,000 cash in a business by the proprietor; consequently there is a debit to Cash and a credit to the proprietor's account. The debit item is entered in the cash column. A check mark is immediately placed in the ledger-folio column to serve as a reminder to the bookkeeper that this item will not be posted separately. A special column is not maintained for credits to the proprietor's account; therefore the entry for this part of the transaction is made in the sundries credit column and no check mark is placed in the ledger-folio column. This entry will be posted separately and the ledger page on which is found the proprietor's account will be entered in the folio column.

In the second transaction debits are made to two accounts for which special columns are not maintained. The debit amounts involved, real estate \$15,000 and building \$20,000, are placed in the sundries debit column and are posted to the ledger accounts affected separately. The credit to Cash, \$35,000, is entered in the special credit column for Cash and a check mark is placed in the ledger-folio column as before.

The third entry records the purchase of merchandise amounting to \$6,000 on account. Both the debit and credit items for this transaction are entered in special columns and check marks are placed in the ledger-folio columns. Had this purchase been made for cash the debit item would have been handled in the same way but the credit entry would have been listed in the cash credit column.

All entries are made according to the method shown in these

transactions. *The columns reserved for sundries are used for making entries affecting accounts for which special columns are not maintained and the items in these columns are posted separately. All other entries are listed in the appropriate special columns. The total of each special column is carried forward to the end of the period covered by each posting — a month in this case, it may be assumed. For example, the total of the cash debit column, \$47,485, is brought over to the sundries column and from there is posted to the ledger just as is any other sundry item. This one posting carries all of the items in the column for cash debits to the ledger in one sum. The operation of posting the remaining special columns is similar.*

That this form of journal effects a great saving in posting is evident even from the above simple illustration. The total number of entries made in special columns is thirty-nine, while the number of postings from these columns is eight, making a saving of thirty-one postings. Since the ledger accounts show just as much information as they would if the simple journal were used, this may be considered a net saving. In the case of an enterprise where the entries run into the hundreds per day, the cost of keeping books would be very materially reduced by such a method.

The extent to which the special-column principle may be carried is practically unlimited. There could be special columns in the journal for each ledger account. In this case the postings would be made in totals to all accounts. Such a procedure would be inadvisable, however, as there are some accounts in which only one or two entries at the most are made in a single period. The use of special columns for such accounts would not only fail to save work in posting but would make necessary the use of an unduly large book, which in the end would actually increase the work of the bookkeeper.

The possibility for labor saving is often dependent upon the use of controlling accounts and subsidiary ledgers. The general significance of the controlling account was explained in the last chapter and in the journal above this principle is illustrated for Accounts Receivable and Accounts Payable. The total amount receivable on customers' accounts constitutes one distinct asset item for balance sheet purposes. The amount due from an

individual customer is of little importance in the presentation of a statement showing a firm's financial condition. It is the summary of all the customers' accounts that is significant. It is obvious that for other purposes, however, a knowledge of the amounts due from individual customers must be available. In order to serve both of these purposes the controlling account is used. That is, an account is kept in the general ledger called "Accounts Receivable" in which the debits and credits to *all* customers are entered. In addition to this a special ledger called the customers' or sales ledger is used in which a separate account with each customer is kept. The general ledger account is used for obtaining the information for financial statements while the customers' ledger is used for the detailed information concerning each customer's account. This procedure necessitates the entering of the same information in duplicate. A saving is effected by placing all debits and credits to the controlling account in special columns in the journal and posting in total from these columns to the general ledger account. Two postings to the controlling account are all that are required for each accounting period.

The separate amounts must be posted to the customers' ledger in order that each individual's account will always show the balance due. There are various methods used in practice in making these postings. In the illustration given, two ledger-folio columns are employed, one for general ledger postings, the other for subsidiary ledger postings. Take, for example, the entries under date of January 5th. On this date J. R. Kerwin purchased goods amounting to \$50 on account. This transaction requires a debit to Accounts Receivable in the general ledger and an item of \$50 is entered in the accounts receivable debit column. An entry of \$50 must also be made to J. R. Kerwin's account in the customer's ledger. J. R. Kerwin's name is entered on the line used for the name of the account to be debited. At the time for posting, the \$50 item is posted to his account in the customers' ledger and the ledger page is entered in the ledger-folio column reserved for subsidiary ledger entries. A great many improvements have been made in the customers' ledger which have simplified the process of posting to that book. In fact systems have been devised which eliminate this work altogether.

A discussion of these methods will be deferred to a later section of this chapter, however.

What has been said with regard to customers' accounts may be applied in principle to the creditors' accounts. In this case the general ledger account is called "Accounts Payable"; the subsidiary ledger is called the creditors' or purchase ledger. In fact the controlling account device may be used wherever summary information is desired for one purpose and detailed information for another. In a complex system of accounts for a large enterprise practically every general ledger account controls a subsidiary ledger.

In the special-column journal of the above illustration the entries were made in the conventional form described in Chapter IV. That is, the debit account was written on one line and the credit account was placed on the next line slightly indented to the right. The entries for cash sales, for example, were made in this form:

50	Cash	
	Sales	50

In actual practice a bookkeeper shortens the entry, writing it as follows:

50	Cash Sales	50
----	------------	----

The \$50 item at the left is entered in the cash debit column; that at the right is listed in the sales column. Since both entries are recorded in special columns, one line may be used as just explained without causing confusion. Many bookkeepers who have become adept in the use of special-column journals find it convenient to place all special-column entries for one day's business on a single line. One case is known in which a bookkeeper made all the journal entries for a month on one page. He had made a wise choice of special columns and had been able to place most of his entries for each day on a single line. Of course when this policy is pursued it is essential that all original documents such as sales memoranda should be kept in a convenient file for reference.

## THE CASH BOOK

Another device for simplifying the work of the bookkeeper consists in the use of specialized journals. Each special journal is used for the recording of entries resulting from a single type of transaction such as cash receipts and disbursements, sales, and purchases. The cash book, as is suggested by its title, is used for recording all entries affecting cash. Transactions for which either a debit or credit to Cash is required are entered in this journal, and no other. This book may be used in a system of journals consisting of an old style journal and cash book, a special-column journal and cash book, or several books of original entry such as purchase book, sales book, ordinary journal, etc., including the cash book. The construction of the cash book is not primarily dependent upon the types of journals used for other original entries and may therefore be discussed independently. The illustration on pages 86 and 87 will serve as a basis for this discussion.

The left-hand page is a complete journal for all transactions recognizing the receipt of cash, while the right-hand page is a complete journal for all transactions involving disbursements. Except for the fact that only cash transactions are entered, the cash book is the same in principle as the special-column journal. The entries are made in much the same manner and the process of posting is essentially the same. For example, whenever cash is received, the amount received is entered in the cash debit column on the left-hand page and the credit item is entered in the appropriate credit column on the same page. If the credit entry is to some account for which a special column is kept, for example, Accounts Receivable or Sales, the amount involved is entered in the column headed by the name of the appropriate account and a check mark is placed in the ledger-folio column opposite the entry. If the credit is to an account such as Capital Stock the amount is entered in the sundries credit column. The items in this column are posted separately. The same things may be said of the right-hand page, except that this side is used for recording cash payments. Credits to the Cash account are entered in the cash column and the corresponding debits are placed either in one of the special columns or in the sundries debit column.



# RECEIPTS

DATE	L F	S L F	ACCOUNTS TO BE CREDITED	EXPLANATION	CASH Dr.	SALES DISCOUNTS Dr.	ACCOUNTS RECEIV- ABLE Cr.	SALES Cr.	SUNDRIES Cr.
Feb.	1	1	Capital Stock	200 shares at par	20,000		150		20,000
	3	✓	A. B. Smith	Received on account	150		200		
	4	✓	R. M. Peterson	Bill of Feb. 1 less 2%	106	4		125	
	6	✓	Sales	Cash sales for day	125				
	8	✓	Bonds	Issued \$5,000 at par	5,000				5,000
	9	✓	J. B. Holdsworth	Bill of Feb. 2 less 1%	108	2	200		
	10	✓	Sales	Cash sales	256			256	
	12	✓	L. D. Woods	Invoice of Feb. 2 net	150		150		
	15	✓	Sales	Cash sales	225			225	
	18	✓	Notes Receivable	L. D. Pierson paid his note	200				200
	20	✓	Interest	Interest on above note	2				2
	25	✓	Sales	Cash sales	125			125	
	28	✓	C. A. Mallock	Invoice of Feb. 10 less 2%	204	6	300		
		✓	Sales	Cash sales	325			325	
		✓	A. B. Smith	Invoice of Feb. 7 net	135				
		✓	Discount Dr.	Total of column		12	135		
		✓	Accounts Receivable Cr.	Total of column			1,135	1,056	
		✓	Sales Cr.	Total of column					
March	1	✓	Balance	Brought from Disbursements side Feb. 28	27,381				2,019
					2,019				

## DISBURSEMENTS

DATE	L F	S F	ACCOUNTS TO BE DEBITED	EXPLANATION	CASH Cr.	PURCHASE DISCOUNTS Cr.	ACCOUNTS PAYABLE Dr.	MATERIALS Dr.	LABOR Dr.	FUEL Dr.	STORIES Dr.
Feb.	2	8	Rent	Feb. rent in advance	250						250
	3	✓	Materials	10 ton from X Co. for cash	3,250			3,250			
	5	✓	Fuel	Paid invoice of Feb. 2	50					50	
	6	✓	The Watt Co.	Payroll for week	2,040	60	3,000		1,525		
	8	✓	Labor		1,525			205			
	9	✓	Materials		295						
	10	✓	M. B. Say and Co.	Paid invoice of Feb. 2 less 2%	1,470	30	1,500			60	
	12	6	Fuel		60						
	13	✓	Notes Payable	Paid note to J. B. Ray	3,200						3,200
	15	✓	Interest	Interest on above note	32						32
	16	✓	Labor	Payroll for week	2,100				2,100		
	17	✓	The Watt Co.	Invoice of Feb. 6 less 2%	980	20	1,000				
	20	✓	Materials		2,500			2,500			
	21	✓	Labor	Payroll for week	2,300				2,300		
	24	✓	Fuel		110					110	
	26	✓	Haney Mfg. Co.	Invoice of Feb. 16 less 10%	1,800	200	2,000		2,500		
	28	✓	Labor	Payroll for week	2,500						
	12		Discount Cr.	Total of column		310					
	14		Account Payable Dr.	Total of column			7,500	6,045	8,425		
	18		Materials Dr.	Total of column							
	21		Labor Dr.	Total of column							
	21		Fuel Dr.	Total of column						220	
	32		Balance	Carried to Receipts side for March							
	✓				2,019						2,019
					27,381						

It will be noticed that a discount debit column appears on the left-hand page and a discount credit column on the right-hand page. These columns are used to simplify the recording of cash discounts on customers' and creditors' accounts respectively. The transactions which give rise to the cash discount accounts were explained in Chapter IV. An illustration, however, will be needed at this point to make clear the necessity for the special discount columns in the cash book. A bill of goods is sold on February 10th at an invoice price of \$300, with an allowance of two per cent if settled in ten days. The firm making the sale would charge the customer with the amount of invoice on February 10th, making the following entries:

Accounts Receivable . . . . .	\$300	
Sales . . . . .		\$300

If the customer takes his discount on February 20th the actual cash received is \$294, and this amount is accepted in full settlement of the amount originally charged to Accounts Receivable. The necessary journal entries to recognize this situation on the books would be:

Cash . . . . .	\$294	
Sales Discounts . . . . .	6	
Accounts Receivable . . . . .		\$300

Since these entries represent essentially a cash transaction, provision should be made in the cash book for the complete entry. This is accomplished by the use of a special column on the receipts side headed "Sales Discounts Dr." The actual amount of cash received is entered in the cash debit column, the discount in the discount column and the credit to Accounts Receivable in the accounts receivable column, and since all items are entered in special columns, a check mark is placed in the ledger-folio column opposite the entry.

The discount column on the disbursements side is for purchase discounts. The entry on February 15th illustrates the use of this column. It may be assumed that on January 15th the firm purchased materials at an invoice price of \$1,000 with an allowance of two per cent for payment within thirty days. The entries would be:

Materials . . . . .	\$1,000	
Accounts Payable . . . . .		\$1,000

Then on February 15th when payment is made, the journal entries would be :

Accounts Payable . . . . .	\$1,000	
Cash . . . . .		\$980
Purchase Discounts . . . . .		20

These latter entries must be made on the disbursements side of the cash book, and a special column should be provided for the credit to Purchase Discounts. If the cash book were used, however, entries covering this case would be made by placing the cash payment in the cash credit column, the discount in the discounts credit column, and the sum of the two in the accounts payable debit column.

One line is usually sufficient for recording a complete transaction in the cash book. On the receipts side all debit entries are placed in special columns ; no occasion arises for the use of a sundries debit column ; and hence there is no need of naming the accounts to be debited as the fact that the transaction is entered in the receipts side means that Cash (or Cash and Sales Discounts) is debited. The name of the account to be credited must be stated, however, and this is placed in the column headed "Accounts to be credited." On February 1st, for example, the name Capital Stock was entered in this column, and an item of \$20,000 on the same line in the sundries credit column. This means that \$20,000 must be posted to the credit of Capital Stock. The same amount is, of course, also entered in the cash debit column. Thus the entries for the complete transaction are made on a single line. The same thing is true of the disbursements side except that here the credit entries are always made in the cash credit column (and discount credit column where necessary), and the name of the account to be debited is placed in the proper column on the same line.

The column totals are posted in a manner similar to the process described for the special-column journal. Postings to subsidiary ledgers are also made in much the same manner. The name of the customer's account to be credited for a cash receipt, for ex-

ample, is entered in the column headed "Accounts to be credited." A check mark is placed in the general ledger-folio column, as the posting to the controlling account will be made in column total. When the proper amount is posted to the credit of the individual customer's account the number of the ledger page is placed in the subsidiary ledger-folio column.

As a final consideration, mention should be made of the possibility of using the cash columns in place of a cash account in the general ledger. It will readily be seen that, since all cash receipts are entered in the cash debit column and all cash payments in the cash credit column, these two columns contain all the information usually given in a cash account except the opening balance. This figure may be placed on the receipts side on the first day of each period following the closing of the accounts and the closing balance on the disbursements side immediately preceding the closing of the accounts. When this is done, no cash account is kept in the general ledger. The process of closing accounts will be fully discussed in a later chapter.

#### THE SALES BOOK

Sales transactions constitute another distinct phase of the business and therefore usually form the basis for another specialized journal. Like the cash book, this journal as generally constructed is in the nature of a special-column journal, the entries in this case being limited to credit sale transactions. The table on page 91 is an illustration of a typical sales book page.

There are two debit and three credit columns in this sales book. The debits for sales transactions will generally be made to Accounts Receivable since most sales are on open book account. One debit column is therefore maintained for Accounts Receivable. A sundries debit column is used for debits to the accounts involved when the sale is not made on open book account. The sales on February 15th and 20th, for example, were made for promissory notes. The debit in each case was to Notes Receivable and was entered in the sundries column. The items in the sundries column are posted separately, the other columns are posted in total.

DATE	L	S	NAME OF ACCOUNT TO POST DEBITED	EXPLANATION	SUN- DRIES Dr.	AC- COUNTS RECEIV- ABLE Dr.	SALES DEPT. A Cr.	SALES DEPT. B Cr.	SALES DEPT. C Cr.
Feb.	1	✓ 15	J. B. Crane	Inv. 1 Terms 5-30		240	130	110	
	✓ 6		A. B. Woods	Inv. 2 Terms 2-10		150	120		30
	3	✓ 18	J. B. Parker	Inv. 3 Terms 1-30		215		35	180
	✓ 54		A. M. Spencer	Inv. 4 Terms 2-10		75	30	45	
	7	✓ 4	Bennet and Co.	Inv. 5 Terms 1-30		215	100	75	40
	10	✓ 12	McGuire Supply Co.	Chicago Inv. 6 n-60		175			175
	15	10	Notes Receivable	R. M. Jones & Co. for Inv. 7	235		70	35	130
	17	✓ 16	L. M. Hayes	Inv. 8 Terms n-30		125	15	10	100
	20	10	Notes Receivable	M. A. Pierson on Inv. 9	185		110	50	25
	23	✓ 98	Fred J. Jevons	Inv. 10 Terms 2-10		385	210	120	55
	25	✓ 5	Kane Webster & Co.	Inv. 11 Terms 2-30		256	125	31	100
	26	✓ 15	J. B. Crane	Inv. 12 Terms 3-30		195	75	120	
	27	✓ 45	L. N. Keller	Inv. 13 Terms 2-10		360		45	315
	✓ 7		Carter and Watt	Inv. 14 Terms 1-30		160	25	35	100
	28	✓ 21	A. K. Rawlins	Inv. 15 Terms n-30		225	115	100	10
	✓ 63		Ellis Baker & Co.	Inv. 16 Terms 2-30		75	15	60	
	✓ 8		K. V. Harvey	Inv. 17 Terms 1-30		215	25	95	95
	✓ 24		Albert Peters Co.	Inv. 18 Terms n-30		135	76		59
	15		Accounts Receivable	Total of column		3,201			
			Dr.						
	25		Sales Dept. A	Cr. Total of column			1,241		
	27		Sales Dept. B	Cr. Total of column				966	
	29		Sales Dept. C	Cr. Total of column					1,314

Cash sale transactions are not recorded in this book. Such transactions must be entered in the cash book anyway if the cash columns are used for a cash account. A sales column (or columns) on the receipts side of the cash book makes the posting of the credit sales entries very simple. To enter such transactions in the sales book also would entail needless duplication. It is sometimes urged that the sales book should include cash sales so that the total of all sales may be in one place. This information can be readily ascertained, however, by adding the cash book and sales book figures together or by reference to the Sales account after both journals have been posted.

The three credit columns are for the sales accounts for the three hypothetical departments of this business. Departmental sales accounts are of importance for comparative purposes. Often a separate sales organization is maintained for each of the different departments and in such cases these accounts serve to inform the manager of results attained by the departmental heads. In any case a knowledge of the sales by departments is of importance for managerial purposes.

The posting process is the same as for the other journals already described. Special columns are posted in total with ledger pages entered in the appropriate column. The customers' ledger pages are entered in the second ledger-folio column.

### THE PURCHASE BOOK

This book is kept for the purpose of recording the same kind of information in regard to purchases as the sales book shows for sales. The form of a purchase book is essentially the same as that of a sales book except that the debits are to materials or merchandise accounts and the credits mainly to Accounts Payable instead of Accounts Receivable and Sales respectively as for the latter. A page from a purchase book might appear somewhat as follows :

DATE	L F	S L F	NAME OF ACCOUNT TO BE CREDITED	EXPLANATION	SUN- DRIES Cr.	AC- COUNTS PAY- ABLE Cr.	MER- CHAN- DISE DEPT. A. Dr.	MER- CHAN- DISE DEPT. B. Dr.	MER- CHAN- DISE DEPT. C. Dr.
Feb.	1	✓ 6	The Davenport Mfg. Co.	Inv. 1 Terms 2-10		215	100	15	100
	3	✓ 8	The Iowa Supply Co.	Inv. 2 Terms 2-10		365	315	50	
	4	✓ 10	The Detroit Machine Co.	Inv. 3 1-30/n-60		225	200		25
	5	✓ 5	Grand Rapids Furn. Co.	Inv. 4 Terms 1-30		195	95	25	75
	9	✓ 17	Barnes Desk Co.	Inv. 5 Terms 2-30		3,200	1,980	20	1,200
	12	✓ 32	Muskegon Furniture Co.	Inv. 6 1-30		1,295	895	400	
	15	✓ 19	Marshall Table Mfg. Co.	Inv. 7 Terms 2-10		985	365	20	600
	19	✓ 45	Smith and Black	Inv. 8 Terms 5-30		876	676	125	75
	21	✓ 66	Fetter Lamp Co.	Inv. 9 Terms 2-10		725	725		
	22	✓ 71	Grand Haven Piano Co.	Inv. 10 Terms 1-30		350	300	15	35
	23	12 ✓	Notes Payable	Rochester Glass Co. 6% note	250		50	75	125
	24	✓ 6	Davenport Mfg. Co.	Inv. 12 Terms 1-30		225	75	15	135
	25	✓ 25	Mallock Hastings & Co.	Inv. 13 Terms n-30		350		350	
	28	✓ 23	Shaw Supply Co.	Inv. 14 Terms 2-10		215	100	10	105
		✓ 32	Electric Iron Co.	Inv. 15 Terms 2-10		160	80	40	40
		✓ 35	Marshall and Field	Inv. 16 Terms 1-30		75	15	60	
	25		Accounts Payable	Total of column		9,456			
			Cr.						
	16		Merchandise Dept. A	Total of column			5,971		
	19		Merchandise Dept. B	Total of column				1,220	
	22		Merchandise Dept. C	Total of column					2,515
			Dr.						

All purchases of merchandise except those for which cash is immediately paid, are entered in this book. Cash purchases like cash sales are entered in the cash book, and to enter these transactions again in the purchase book would involve needless duplication. The form of entry is the same as for the sales book. There are two ledger-folio columns, one for general ledger pages and one for the creditors' ledger pages. The first money column is for sundry items and is used to show the amounts credited to accounts for which no special credit columns are kept. In this case the only special credit column is for Accounts Payable, and, as most purchases are made on open book account, most of the entries are made in this column. The only sundries column entry in the illustration was for the transaction on February 23rd when a note was given for the purchase of \$250 worth of merchandise. This amount was credited to Notes Payable through the sundries column.

The remaining three columns are for debits to the merchandise accounts. Three merchandise accounts are shown for the three departments of the business corresponding to the sales accounts as shown above. It is customary to limit the purchase book to entries recording the purchases of merchandise (or of materials in the case of a manufacturing enterprise) but other items such as labor and supplies could be charged here if special columns were kept for that purpose. The process of posting is essentially the same as from the sales book.

#### THE VOUCHERS PAYABLE REGISTER

The charters or by-laws of a great many corporations provide for the incurring of liabilities and the payment of the same only on written authorizations of certain officers. When this provision obtains, it means that payments may be made only to cancel obligations which have already been recognized as liabilities. Stated in another way it means that all purchases — from the viewpoint of the bookkeeper — are made on open account. Furthermore it is customary for corporations to make settlements of creditors' accounts within the allowed discount period for each invoice. These facts make the purchase book of exceptional importance and make possible its use for other pur-



poses than those mentioned in the preceding section. This is usually accomplished through the substitution of what is called a *vouchers payable register* for the purchase book.

A detailed description of a vouchers payable register can best be made on the basis of the illustration of a page from such a book shown on page 95.

The first column after the date in this book is headed "Voucher No." This refers to the number of the voucher on which the authorization of the proper official is placed. Immediately upon receipt of an invoice from any creditor, the bookkeeper makes out a voucher covering the invoice and sends it to the proper official for his signature. As soon as the voucher is signed, it is entered in the vouchers payable register. Each voucher is given a number. The voucher itself is then placed in a file for unpaid vouchers where it is kept until paid. On the date of payment it is removed from this file; the treasurer is instructed to draw a check for the amount; after which the voucher is placed in another file for vouchers paid. This same routine is followed no matter how short the time between receiving the bill and the making of payment. Even the entries for so-called cash transactions are handled according to this procedure.

In the series of columns which follow the voucher number column, the name of the party to whom the voucher is payable, the address and a statement of the purpose are entered to further describe the voucher. Entries are made in the columns headed "When and How Paid" at the date of payment. The unpaid voucher file constitutes the creditors' ledger and no other creditors' accounts are kept. This saves all the posting to the creditors' ledger usually required from the ordinary purchase book.

All of the remaining columns are for journal purposes. The first money column is headed "Vouchers Payable Cr." The total amount of every voucher is entered in this column. This recognizes the indebtedness of the corporation on each voucher at the time it is properly signed. It might be called the accounts payable credit column. The series of columns immediately following this one are for the accounts to be debited. Special columns are kept in this case for three departments of merchandise, and for Labor, Advertising, Fuel, Freight, and General Administrative Expense. The "Sundry Accounts Dr." column is

## DEVELOPMENTS IN TECHNIQUE

[illegible]

placed at the extreme right of the page. Here there is one space for the amount, one for the name of the account to be debited, and one for the ledger folio.

A slightly different method of posting the column totals is shown here. Instead of carrying the total of each special column over to the sundry column for posting so that the ledger page can be entered in the ledger-folio column, the posting is made directly from the column total and the ledger page is placed just below the total in parentheses, thus, (41). This procedure has the advantage of economizing space especially when several special columns are used.

When the vouchers payable register is used, the disbursements side of the cash book can be very greatly simplified. Since every payment must be made on an authorized voucher, the debit for every payment must be to the Vouchers Payable account. Three columns then are sufficient, vouchers payable debit, discount credit, and cash credit.

#### SPECIALIZED LEDGERS

So far the illustrations of technical improvements have been concerned primarily with journal rulings. More progress has been made in simplifying the books of original entry than those of account, but some of the modifications in the ledger are of sufficient importance to bear mention in this connection. In practice the general ledger accounts are usually kept in the form shown in the last chapter. Sometimes, however, the arrangement of the columns is changed so that the debit and credit money columns are adjacent and a third column is added for the purpose of showing the balance continuously. Again, the ledger is often kept in a loose-leaf binder in order to keep the active accounts in compact form without carrying the dead or inactive accounts. The general ledger usually contains a great many controlling accounts supported by subsidiary ledgers. In fact in the case of a large corporation nearly every general ledger account controls some subsidiary ledger. In the case of a manufacturing company, for instance, the Buildings and Equipment accounts are supported by building and equipment ledgers having detailed records of separate buildings, units of machinery, and equipment. The

manufacturing and sales expense accounts are supported by factory cost ledgers, etc. These are detail questions which present themselves more particularly in the designing of systems of records for specific firms and generalizations of importance cannot well be made. The customers' ledger is common to most enterprises, however, and a brief discussion of modern developments in this book is given here.

In the retail merchandise business one form of customers' ledger has been almost universally adopted. This may be called the *slip system*, although the specific system in any case usually bears the name of the manufacturer who produces the ledger forms. The salesman makes out a detail slip in duplicate or triplicate at the time of making a sale for credit. This slip gives the name of the customer and specifies the articles sold and the amount of the bill. One copy is given to the customer and one is kept for ledger purposes. All of these credit sales slips are added up at the end of each day and one journal entry is made covering all credit sales. This entry of course would be made either in the special-column journal or sales book (whichever is used). The slips are then filed by customers' names, and the file constitutes the customers' ledger. This procedure saves all the time required to post from the sales book to customers' accounts. When the customer pays his account he is given a receipt which is also made out in duplicate. The duplicate, after being used for making the cash book entry, is filed with the sales slips. This makes the record with each customer complete in the file.

The same method in principle is often used by manufacturers. Here the invoice covering a sale of goods is made out in duplicate, the original being sent to the customer as an invoice and the duplicate retained for his account. These duplicate invoice sheets are first used for sales book entries and are then filed alphabetically by customers' names. This file constitutes the customers' ledger. The form of file depends on the form of invoice. In some cases the invoices are prepared to fit a loose-leaf binder. Again the duplicate might be made on a card of convenient size for placing in a card file. Even the standard letter file might be used, although the looseness of such a system makes possible a great many errors which would not occur as frequently under one of the other methods.

Local public utilities such as gas, electric, water and telephone companies which bill their customers but once a month often have the sales book arranged in such form that it may also be used for a customers' ledger. The table on page 99 is an illustration of a page from such a combination sales book and customers' ledger for a gas company.

This book is arranged in such a form that considerable statistical information in addition to sales and customers' accounts is available. In the first place the names of all customers are arranged in a convenient order usually according to the meter readers' routes. This is done so that the index readings obtained from the meter readers' book may be copied in consecutive order. The reading from the previous month in each case is set down in the first index column and the reading for the current month is placed in the next column, and the difference between these two columns is listed in the column headed "Amount Consumed Cu. Ft." The total of the amount consumed column shows the total amount of gas actually sold. This figure is of considerable importance to the plant manager. A meter at the plant registers the total amount produced and by comparing that figure with the amount registered by the customers' meters, he can determine the amount lost and unaccounted for. This figure of course he tries to keep as low as possible.

The gross amount of each bill is shown in the next column. This is found by multiplying the rate by the amount consumed. The discount allowed for prompt payment of the bill is listed in the following column. The difference between the gross bill and the allowed discount is placed in the column headed "Net." The total of this column represents the total net sales for the month and can be used for making the proper entries in the ledger — a debit to Accounts Receivable and a credit to Sales. This is the extent to which the book can be used for journal purposes, the remaining columns being exclusively for ledger purposes.

Any unpaid balances from the preceding month are carried to the column to the right of the net figure. The second customer in the illustration, John B. Campbell, failed to pay his December bill as shown by the fact that \$3.10 is listed opposite his name in the column headed "Brought forward from December." The sum of the figures in the net and brought forward columns

No.	NAME	ADDRESS	METER No.	JANUARY									
				INDEX		AMOUNT CONSUMED Cu. Ft.	GROSS BILL	DIS- COUNT	NET	BROUGHT FOR- WARD FROM DECEM- BER	PAID		FORWARD TO FEBRUARY
				Dec.	Jan.						Date	Amount	
1	Geo. B. Freeman	185 Palm St.	2658	0000	2400	2400	3 00	60	240		Jan. 8	2 40	
2	John B. Campbell	192 Palm St.	3895	24	52	28	3 50	70	280	3 10	9	3 10	3 50
3	Arthur Wagner	195 Palm St.	3687	38	65	27	3 37	67	270		5	2 70	
4	G. P. Giessing	675 Third St.	3295	15	50	35	4 37	87	350		2	3 50	
5	Jesse Berch	698 Third St.	6385	13	20	16	2 00	40	1 60				2 00
6	John Smith	295 Palm St.	2300	7	38	31	3 87	77	3 10	2 15	11	5 25	
7	Richard Snow	210 Palm St.	9685	0	30	30	3 75	75	3 00		17	3 75	
8	William Harris	635 Fourth St.	2586	16	41	25	3 12	62	2 50		10	2 50	
9	Walter Maine	632 Fourth St.	2768	285	310	25	3 12	62	2 50		9	2 50	
10	Richard Schmitt	638 Fourth St.	3254	116	140	24	3 00	60	2 40				3 00
11	Harold Dums	318 Palm St.	3805	38	71	33	4 12	82	3 30		6	3 30	
12	Mrs. B. J. Snyder	322 Palm St.	5836	45	90	45	5 62	112	4 50	3 75	12	8 25	
13	Raymond Locke	338 Palm St.	2987	72	101	20	3 62	72	2 90		11	2 50	
14	R. M. Peterson	336 Palm St.	3298	0	30	30	3 75	75	3 00		3	3 00	
15	L. D. Cairnes	618 Fifth St.	3296	85	92	7	87	17	70		5	70	
16	M. D. Ray	622 Fifth St.	5875	19	42	23	2 87	57	2 30		8	2 30	
17	K. N. Riess	631 Fifth St.	4287	36	80	44	5 50	110	4 40	2 80	12	7 20	
18	Wm Wilson	485 Palm St.	208	41	72	31	3 87	77	3 10		11	3 10	
	Totals					597	63 32	12 62	50 70	11 80		56 05	8 50
									(65)				
									(84)				

constitutes the debit to the customers' accounts for payments made before the discount period expires. For payments made after this date the gross bill is charged instead of the net.

Credits to the customers' accounts are made in the column headed "Paid." A space is provided to show the date and the amount of the payment. All payments made up to January 12th, the last discount date, are made at the net rate. If a customer fails to pay until after that date, the gross bill is paid. Richard Snow, for example, paid his bill on January 17th as shown by the entries in the paid column on the seventh line and the amount corresponds to the gross charge. The general ledger entries for cash receipts from customers are posted from the proper columns in the cash book. A duplicate receipt is retained by the company which is used first for the cash book entry and then for the customers' ledger.

Finally on the last day of the month the amounts remaining unpaid are carried forward to the proper column in the February section. In the illustration three such amounts are shown on lines two, five and ten.

A single line can be used for a customer's account throughout the year by placing the information for succeeding months in adjacent columns. This can be accomplished without making the book unduly large by the use of a system of large and small pages in a single binder. The columns for the customers' names and addresses and for the meter numbers can be placed on the left-hand side of a large page, then a sufficient number of smaller pages can be inserted for carrying the remaining columns grouped by months as was shown for January in the illustration. The edges of the smaller sheets would then come even with the meter number column.

This method of treating customers' accounts for public utilities has been quite widely adopted by gas, electric, water, and telephone companies but it has certain disadvantages which have prevented its being used in many places. Its greatest labor saving feature depends on the permanency of its customers. The whole list of names is revised but once each year. New names are added at the end of the book and whenever a meter is removed for a customer his line in the ledger remains blank for the rest of the year. This is a very important consideration in

what may be called a transient community, where a great many meters are being removed and new ones set each month. In such cases it is much simpler to maintain a separate ledger page for each customer's account. The following is a page from the customers' ledger of a gas company which comes within this class.

FOR MONTH	INDEX	CONSUMED	AMOUNT NET	BACK BILL	PAID	DATE	DISCOUNT
ENDING	000						
1917						1917	
Jan.	24	24	2.40		2.40	Feb. 5	
Feb.	89	65	5.85		6.50	Mar. 24	.65
Mar.	110	21	2.10			Apr.	
Apr.						May	
May						June	
June						July	
July						Aug.	
Aug.						Sept.	
Sept.						Oct.	
Oct.						Nov.	
Nov.						Dec.	
Dec.						1918	
1918						Jan.	
Jan.						Feb.	

For each customer one of these sheets is kept in a loose-leaf binder. The order of names in the ledger follows the route order of the meter readers. As new meters are set new sheets are inserted in the proper place and as old meters are removed the customer's sheet is removed from the binder.

This form of ledger makes its use for sales book purposes somewhat more awkward than the preceding one but it is used for this purpose nevertheless. As soon as all bills have been entered for the month an adding machine total of the charges to all customers' accounts is taken. This total is the basis for the debit to Accounts Receivable and the credit to Revenue. Thus a special sales book again is unnecessary.



The illustrations given in this chapter show the present tendency to abbreviate the accounting records and to simplify the work of the bookkeeper. In every type of business the forms of records are being constantly altered and improved in various ways to decrease the detail work required. The illustrations can only be suggestive, however, since the actual records found in a given case should and do depend on the type of business and the kinds of information desired. No particular system of journal and ledger forms could be universally adopted.

## VI

### THE ASSET ACCOUNTS

ACCOUNTS were classified in Chapters II and III in terms of assets and equities, and the important phases, positive and negative, of these balance sheet classes. This classification is of fundamental importance in that it constitutes the skeleton of any system of accounts which should always be kept in mind in the process of analyzing transactions into debit and credit entries. Further division and analysis are necessary at this stage, however, if the student is to have an adequate understanding of the nature of the common accounts which are used in recording business data and the significance of the various transactions which may affect these accounts. In the present chapter the asset accounts will be considered in some detail. The nature and function of each of the important sub-groups will be explained; and typical occurrences which give rise to entries in these accounts will be discussed. This discussion will serve to illustrate further the principles of journalizing. Some consideration will also be given to the problem of detail classification for managerial purposes. In Chapter VII the equity accounts will be further classified and explained.

#### ACCOUNTS WITH FIXED TANGIBLE ASSETS

Among the assets perhaps the most important general distinction is between *fixed* and *current* items. Several references to this classification have already been made, and in the following pages it will be necessary to return to this division repeatedly. Fixed assets, in turn, may be divided into material and immaterial — or *tangible* and *intangible* — items. In this section the important types of accounts with fixed tangible assets will be discussed.

In this group may be included all those accounts which represent the more permanent types of material property. Land, buildings, and machinery are common examples of the fixed tangibles. These assets represent the durable equipment of the enterprise. This equipment is purchased to be used in operation, not to be sold. Usually a large part of the capital of an enterprise is invested in such assets. For this reason, and because such items present difficult problems in connection with valuations, the accounts with the fixed tangibles constitute the most important group of fixed asset accounts.

The debit side of such accounts — as is the case with all asset accounts — is used in recording *additions*. These additions should not be thought of primarily in the physical sense. The data with which accounting deals are *values*, measured in terms of the money unit. Additions to these assets, then, mean value additions; and such increases in a particular case may be due either to the receipt of additional physical units, to the improvement of units already owned, or to an advance in prices which alters the value of units in use. All possible situations which give rise to charges to these accounts may be put under these three cases.

Then debits to the Buildings account of the A. B. Co., for example, may represent any of the following facts: (1) the original purchase price or construction cost of the buildings owned by the enterprise (or the purchase price or construction cost of new buildings or additions); (2) the amount of an improvement; (3) the increase in the value of the buildings due to price changes. Cases (2) and (3) require brief explanation. An improvement, in the accounting sense, is an increase in the value of an asset caused by a change in the physical structure of the asset. The replacement of a shingle roof with a more expensive slate roof is an illustration. The difference between the value of the old roof and that of the new is an addition to the value of the building, and hence properly represents a charge to the Buildings account. Increases in value above cost which are not due to improvements are usually caused by an advance in the prices of labor and materials either during the period of construction or after the building is finished. It should be noted, however, that it is seldom necessary to make specific debit entries in the Buildings account, to

cover such increases. With the exception of land most tangible fixed assets decline in value as a result of operating conditions at a rate more than sufficient to offset any advance in purchase prices or construction costs. The actual rate of expiration, nevertheless, varies because of these price changes; and if such a variation is taken into consideration in accounting for value declines this virtually means the recognition, in the accounts, of price advances.

The policy of recognizing *all* value increases — from whatever source — as proper matters for accounting record assumes that it is the function of the property accounts to show continuously the actual value of the equipment owned in any case. The legitimacy of such an assumption cannot be conveniently discussed at this point. This and other fundamental problems of valuation will be carefully considered in Chapter XX. For the present it will be taken for granted that every asset account should show present values as far as possible.

Entries in the credit side of these accounts represent *subtractions*. These subtractions may indicate either of two distinct happenings: (1) a credit entry may represent the sale or disposal of a specific unit or units of an asset; or (2) a credit may represent the value expiration of units still in use as a result of business operation and unfavorable price changes. In the case of a successful enterprise there is a sense in which the expiration of an asset due to the conditions of operation may be conceived as the sale of an asset, or the exchange of one asset for another; for certainly the equipment which is consumed in the process of production is normally replaced from the proceeds of the sale of product. But, as was stated in Chapter III, entries covering the expirations of assets cannot conveniently be made concurrently with the entries recording the additions to assets resulting from the sales of finished goods. Hence, as an important accounting consideration, the distinction between the two types of subtractions from assets should be emphasized.

Then credits to Buildings, for example, may represent either of the following facts: (1) the selling price of a new or second-hand building or buildings; (2) the amount of the value expiration of a building or buildings during a given period (normal or abnormal depreciation). Each of these cases will be briefly discussed.

Since an enterprise seldom sells all or any part of its fixed equipment credits representing case (1) are of very infrequent occurrence. When a particular building or other asset is scrapped, however, it commonly has some small salvage value, and the entry covering this amount represents, in a sense, the sale or disposal of a fixed asset. Other transfers also occasionally occur. A firm, for example, which owns several buildings and sites, may find it desirable to sell a parcel of its real estate even when the unit sold is in good physical condition.

The second case of subtractions mentioned above is of much more common occurrence. As already explained, most of the items which make up a firm's fixed equipment are continuously depreciating. With the possible exception of land a "fixed" asset is not usually a permanent asset. The managements of business enterprises have sometimes ignored this obvious fact to their sorrow. Wear and tear from use and the action of the elements, or *deterioration*, is the most universal, and perhaps the most important, cause of depreciation. *Obsolescence*, or value decline due to the fact that a certain type of equipment has been rendered out of date by new inventions and improvements, is another important cause of depreciation — in some cases the most significant. Price changes which lower purchase prices and construction costs, and general economic changes which render specific types of equipment *inadequate* for the purposes for which they were intended (such as a change in the character of railway traffic which compels a railroad company to substitute box cars for flats), are also factors responsible for large amounts of depreciation.<sup>1</sup>

It is the prevailing practice to use valuation accounts to show all subtractions from fixed assets which represent depreciation. These expirations are recognized only at intervals and are credited to valuation accounts, as explained in Chapter III, instead of being credited directly to the asset accounts. One reason for the use of these subsidiary accounts is the desire on the part of the management in any case to preserve original cost figures in the asset accounts. Further, it is sometimes urged that since

<sup>1</sup> No attempt will be made at this point to discuss the difficult problems of depreciation accounting. Chapters XXII and XXIII are devoted primarily to this topic.

the amount of the value expiration of a fixed asset which occurs in a given period is merely an estimate it is desirable to set up the estimated figure in a separate account. It is doubtful if either of these considerations deserves the stress that has been laid upon them by accountants, although they are matters of some importance. Cost figures are not always of great significance; and in any case they can be determined from the books of original entry. And the mere fact that a figure is an estimate is hardly sufficient reason for setting it up in a special account. It is a fact sometimes overlooked that accounting deals, to an important extent, with estimates rather than certainties. Nevertheless the use of valuation accounts in this connection is entirely rational; and it is a practice which is likely to persist.

It is unfortunate that these valuation accounts are usually called "reserves." The term reserve suggests surplus, and is actually applied in practice to special surplus accounts. This nomenclature undoubtedly leads to considerable confusion in interpreting these accounts—even among those with some knowledge of accounting technique. The point should be emphasized here that these accounts are in no sense a part of any of the proprietary or other equity accounts. They belong rather to the fixed asset accounts. Each valuation account must be read in connection with the corresponding asset account. If, for example, the Buildings account of a certain enterprise shows a debit balance of \$10,000 and "Reserve for Depreciation of Buildings" shows a credit balance of \$2,000, this means that the estimated value of the asset, buildings, is the difference between these two amounts, or \$8,000. The two accounts, taken together, show the status of the asset. The term *allowance*, as already suggested, is a more suitable designation than reserve for the valuation account; and this expression, for the sake of clearness, will be used throughout the text.

To sum up, then, it appears that entries in the main accounts with tangible fixed assets are not of very frequent occurrence. The original costs and the amount of all improvements are charged to the property accounts, and all sales are credited to these accounts. All expirations, however, are usually credited to valuation accounts. Occasionally increases in value due to

price changes more than offset the expirations and must be taken into consideration.

The following transactions illustrate the important cases discussed above:

1. The A. B. Co. has contracted for an addition to its plant to cost \$10,000. The work is finished and the contract price is paid in cash. The journal entries for this transaction (in summary form) would be as follows:

Buildings . . . . .	\$10,000	
Cash . . . . .		\$10,000

The entries covering the purchase of an important unit of property would usually be much more detailed than the above. If the A. B. Co. constructed the addition itself a set of construction accounts would be needed. If the work were done by an outside firm payment would usually be made in installments. The entries given, however, show the final effect of the transaction upon the Buildings account.

2. The past year has seen a considerable growth in the population of the city, and as a result land in certain districts has risen in value. The value of the A. B. Co.'s site has appreciated \$2,000. This situation would be recognized in the accounts by the following entries:

Land . . . . .	\$2,000 <sup>1</sup>	
Surplus . . . . .		\$2,000

The increase in land value recorded by these entries means a net increase in proprietorship since no expirations whatever are involved. Consequently the increase in ownership can be credited directly to Surplus. Since the increase has occurred during the year it might be considered proper to credit the Net Revenue account with the amount. Such an item is not, however, a net revenue from operation in the strict sense; and in general it is desirable to use the Surplus account to reflect all speculative changes in the equities. The problem of *appreciation* and the

<sup>1</sup> This increase has no doubt occurred gradually during the accounting period. The charge to Land, then, can be conceived as a summary of a large number of small changes.

entries which should be made to show such value changes in the accounts will receive careful consideration later in the text.

3. It is estimated that the depreciation of the buildings of the A. B. Co. for one month amounts to \$125. This transaction represents a subtraction from a fixed asset of \$125 and an equal charge to Expense.<sup>1</sup> The entries would be :

Expense . . . . .	\$125	
Buildings . . . . .		\$125

Or, if a valuation account were used, the transaction would be journalized as follows :

Expense . . . . .	\$125	
Allowance for Depreciation of Buildings . . . . .		\$125

It is important that the student grasp the exact nature of this variation in the entries which represent such a situation. The charge to Expense is the same in each case ; but in the second pair of entries a credit to a valuation account is substituted for a credit to Buildings. The significance of the credit entry, however, must be the same in both cases ; in either instance it represents a subtraction from the value of the buildings.

4. A building of the A. B. Co. which has become unfit for further use is sold to a wrecking company for \$3,000. The cost of this unit, it will be assumed, was \$15,000. If depreciation has been correctly accounted for the Allowance for Depreciation of Buildings account should show at this time credits amounting to \$12,000 applicable to this unit. Such accuracy in estimating depreciation is, of course, very unlikely ; but to simplify the illustration it will be assumed in this case that there have been credits to the valuation account for the exact amount of depreciation. The entries representing the sale of the old building would then be as follows :

Cash . . . . .	\$ 3,000	
Allowance for Depreciation of Buildings . . . . .	12,000	
Buildings . . . . .		\$15,000

<sup>1</sup> A special expense account might well be used here. The classification of expense accounts will be discussed in the next chapter.



The only actual happening here is the exchange of a building worth \$3,000 for an equal amount of cash. Since the property unit is entirely discarded, however, there is clearly no object in longer maintaining additions and subtractions in separate accounts. Accordingly the two accounts, Buildings and its subsidiary, are balanced as far as this particular unit of property is concerned.

Transactions affecting the accounts with tangible fixed assets will, of course, differ very widely in practice as regards the concrete circumstances involved. The cases discussed and journalized here, however, represent the principal *types* of occurrences which require recognition in these accounts. The student should now be able to analyze any possible transaction involving fixed tangibles as far as its effect upon the asset accounts is concerned. The classification of the equipment accounts for managerial purposes will be discussed in a later section of this chapter.

#### ACCOUNTS WITH FIXED INTANGIBLES

a. First will be considered under this head the group which includes any account with a *right* against — or an equity in — the assets of an individual or enterprise other than the firm on whose books such account appears. Rights which may be said to constitute fixed assets are commonly represented by such instruments as long-term notes, mortgages, bonds, stocks and other securities. Obviously such assets, in themselves, are immaterial items, since they exist as rights rather than as tangible objects; but a right may consist in a lien upon specific tangible assets. A mortgage, or a bond based upon a mortgage, for example, usually represents a lien upon some part or all of the tangible equipment of an enterprise. A promissory note, on the other hand, ordinarily represents a claim against an enterprise itself — or a general claim against the assets of the enterprise — rather than a lien upon specific assets. A share of stock is an evidence of a right of ownership in an incorporated enterprise rather than a right to particular assets; but such a security, nevertheless, also represents a residual general equity in the assets of the enterprise, as was noted in Chapter II.

In this connection the distinction between a right as an asset and the same right as an equity should be emphasized. A right in a specific enterprise, from the standpoint of that enterprise, is an equity, and would appear in the accounts as such. From the standpoint of the individual or firm possessing the right, the item is an asset — provided, of course, that the equity in question has any value. In other words, rights appear in accounting records under duplicate heads — equities in one case, assets in the other. This duplication is, evidently, not possible in the case of tangible assets. In interpreting transactions involving rights, therefore, it is necessary to keep definitely in mind the particular enterprise whose accounts are affected by these transactions.

As regards length of life — or the time the asset remains in the business — long-term securities are often as “fixed” in character as buildings and machinery. Nevertheless there is another line of distinction between fixed and current assets which should be considered. A current asset might be defined as *any asset which can readily be converted into cash* or an equivalent. A fixed asset would, accordingly, be an asset which could not be easily liquidated for its full value. From this standpoint securities and similar rights may be considered current assets; for usually all such rights can be converted into cash with comparative ease. A classification of assets into fixed and current items on this basis is a matter of practical importance in cases where the purpose of the classification is the determination of the immediate financial condition of the enterprise.

Length of life, as well as liquidity, however, is an important general consideration to be observed in classifying assets. In the case of an asset used in operation length of life is roughly expressed in the accounts by the rate with which the item is transferred from an asset account to an expense account. Then a current asset, from this standpoint, is *an asset which passes quickly into the expense category*. A fixed asset is, therefore, an item which remains an asset, in large measure, for a comparatively long interval. According to this definition a security which is held for investment is a fixed asset. But many rights never give rise to expense charges. A contractual right such as that represented by a mortgage may remain of practically constant value — aside from interest accruals — throughout its life. At matu-

rity the contractual sum is paid. This is true of short-term as well as long-term securities. On the other hand a right such as an annuity, which consists in a series of payments which include both principal and interest, expires as the payments are made; and the amount of the expiration in each case constitutes a subtraction from the value of the annuity and a subtraction from the gross revenue received.<sup>1</sup> It is evident that the classification of rights as fixed and current assets is a matter of particular difficulty.

Whichever basis for distinguishing between fixed and current assets be adopted there is no hard and fast principle to be followed which covers all cases. As regards length of life an asset such as a stock of postage stamps, for example, which will be consumed in a few days, is clearly a current asset; and a fire-proof building, which will probably remain in a particular business for many years (and may be a valuable object for a century or more), is obviously a fixed asset. On the other hand a promissory note running, it may be assumed, for three years, might, with reason, be classed in either group. Similarly, in respect to liquidity, the assets of the typical enterprise vary from cash itself to assets which can scarcely be converted into cash except through the process of production; but the point in the series which divides the current assets from the fixed is usually difficult of exact determination.

In some cases rights represent the large part of a firm's capital. Banking, insurance and trust companies are examples of such enterprises. In such cases the accounts representing rights form a very important part of the accounting structure. These accounts may be subdivided for statistical purposes almost indefinitely. An insurance company, for example, may find it desirable to keep subsidiary accounts for each distinct security *issue* which it owns as well as controlling accounts with the principal *types* of securities and other rights in its possession. In the case of underwriting companies and brokerage houses securities are

<sup>1</sup> A share of stock in a wasting enterprise such as a mine represents a sort of indefinite annuity, and is therefore normally a depreciable asset. Any right, of course, may expire either because of changes in the circumstances of the enterprise in which the right is an equity, or because of general changes in the market for such securities. Transactions involving the valuation of annuities and other securities will be considered in detail in Part Three.

usually purchased only to be sold again. Rights constitute the merchandise of such a concern, and the security accounts are analogous to the merchandise accounts of a retail enterprise. Evidently the assets handled in such a case are current rather than fixed. Banking and insurance companies, however, commonly hold large amounts of securities and similar rights as investment indefinitely, or until the specific contracts or securities terminate. This illustrates the fact that the distinction between fixed and current assets depends not merely on the nature of the asset itself in any case but upon the character of the enterprise possessing such asset as well.

Further, almost every large corporation owns securities and rights in other organizations and enterprises which it holds for investment and other purposes. Such holdings are probably becoming more rather than less common. Recent purchases of government bonds on a large scale by "industrial" as well as investment companies illustrate this tendency.

Debit entries in accounts with long-term rights cover, in general, the same possibilities as do charges to the accounts representing the tangible equipment. A debit item may represent the original cost or value of the asset. This original figure usually expresses the market price of the right at the time it was secured. Further, a debit entry may represent an increase in value above the original figure.

Credit entries in these accounts may represent either of two types of occurrences: (1) the sale of specific units; or (2) the decline in value of units remaining on hand. These declines represent either the regular expiration of assets such as annuities, or a fall in market prices due to changes in the interest rate or other factors. It is obvious that no depreciation because of deterioration, obsolescence or inadequacy is possible in the case of rights, for such assets do not consist in material objects. Hence the problems of valuation arising in connection with rights are in general less complex than in the case of the fixed tangibles.

The Bonds account of an insurance company, for example, would therefore be charged with the cost or value of all bonds secured, and with all appreciations. This account would be credited with the amounts received from sales of bonds or amounts

realized at maturity dates and with all declines in value.<sup>1</sup> The following transactions illustrate these cases:

1. The company buys U. S. 4's to the amount of \$50,000. The entries would be as follows:

Bonds . . . . .	\$50,000	
Cash . . . . .		\$50,000

2. An inventory discloses the fact that certain bonds have appreciated in value, \$8,000. The journal entries would be:

Bonds . . . . .	\$8,000	
Surplus . . . . .		\$8,000

The credit in this case might be to the Net Revenue account (as suggested above in the case of land appreciation), or even to Revenue, provided such appreciations were a regular source of income to the company. The recognition of such value changes assumes that it is the function of these "right" accounts — as well as the accounts with tangible assets — to show present values whenever this is practicable.

3. Bonds (Harrison Railway 5's, due 1925) are sold on the market for \$62,000. The entries would be:

Cash . . . . .	\$62,000	
Bonds . . . . .		\$62,000

These entries assume that the bonds were sold at a price to yield the book value. If a gain were realized on this sale the amount of the gain should be a credit to Surplus as in the preceding case instead of a credit to Bonds; but the concurrent debit entry would be to Cash rather than to the Bonds account since the gain is realized in cash in this case.

4. It is discovered that bonds owned by the company have fallen in value, \$5,000. This transaction would be journalized as follows:

Surplus . . . . .	\$5,000	
Bonds . . . . .		\$5,000

<sup>1</sup> Transactions involving accumulation of discount or amortization of premium also affect bond values. These transactions and other occurrences involving questions of principal and interest will be discussed in Part Three.

A firm that buys and sells bonds as merchandise would find it convenient to use at least three bond accounts. One of these accounts would show purchases, another sales and a third would represent inventories. By combining these accounts<sup>1</sup> the amount of net revenue or net loss for a given period could be ascertained. Such accounts are exactly analogous to the merchandise accounts which will be explained in Chapter VIII. In the entries shown above, all variations in the value of the insurance company's bonds are credited or charged to Surplus as the case may be, for it is assumed that these assets are held for investment purposes and that variations in their value are outside of the regular expense and revenue accounts of the enterprise.

It should be recognized that the transactions considered above are merely suggestive of the important types of occurrences affecting accounts with long-term securities. Enterprises whose assets consist largely in rights require intricate systems of accounts; and the construction and analysis of such systems constitute a special branch of accounting of considerable importance. In this text it will not be convenient to discuss the details of such special systems; but some further consideration will be given in later chapters to transactions involving security valuations.

*b.* Special mention should be made of those accounts which represent long-term rights to *services* rather than rights to liquid assets as income or principal. The right to protection from fire-loss for a period of three years, represented by an insurance premium, might be considered a fixed immaterial asset on the books of the company making the payment. A warehouse lease running for ten years, payment (\$5,000) made in advance, furnishes a better example. The amount of the payment would be a charge to a fixed asset account, thus:

Lease . . . . .	\$5,000	
Cash . . . . .		\$5,000

The asset in this case consists in the right to use a certain other asset for a ten-year period. Any payment which a firm makes for services which will be furnished over a considerable period represents a similar asset.

Transactions giving rise to such rights are of fairly common occurrence in business practice. The term "deferred charge"

<sup>1</sup> All other expense and revenue items would, of course, be included in the computation.



particularly difficult, further discussion of this group of asset accounts will be postponed for the present. Chapter XXIV is devoted to a consideration of the nature and accounting treatment of these and similar intangibles.

#### FUNCTIONAL CLASSIFICATION OF FIXED ASSET ACCOUNTS

In the case of large and complex enterprises a *functional* classification of the accounts which represent the fixed assets of the business is of great practical importance. For managerial purposes the fixed investment applicable to each department or phase of the enterprise should be segregated in the accounts as far as possible. Only by means of such classifications can the management secure from the accounting records the data needed in making comparisons for the purpose of determining the relative efficiency of specific plants, departments, processes, etc. In this connection the functional classification of expense accounts (see the next chapter) is of even greater importance; but such a classification in any case is facilitated by a corresponding division of the asset accounts. No attempt will be made at this point to discuss in detail any of the special systems of asset accounts required for particular types of enterprises.<sup>1</sup> The student is better qualified to consider this subject after the completion of a survey of the general field of accounting principles. It is important, however, that the point of view involved in this very significant matter should be suggested at this stage.

A simple classification of the fixed asset accounts of an enterprise conforms to the important departments or phases of the business. In a manufacturing establishment, for example, there are the assets devoted to manufacture or production in the narrow sense, the assets comprising the selling equipment, and the assets utilized for general or administrative purposes. The following outline of accounts illustrates such a classification :

<sup>1</sup> Part Six of the text is devoted largely to a discussion of special systems of accounts for manufacturing, railroad and municipal enterprises.



## MANUFACTURING

- Factory Site;
- { Factory Building;
- { Allowance for Depreciation of Factory Building;<sup>1</sup>
- { Factory Equipment;
- { Allowance for Depreciation of Factory Equipment;
- Materials Warehouse Site;
- { Materials Warehouse;
- { Allowance for Depreciation of Materials Warehouse;
- { Transportation Equipment;
- { Allowance for Depreciation of Transportation Equipment.

## SELLING

- Finished Goods Warehouse Site;
- { Finished Goods Warehouse;
- { Allowance for Depreciation of Finished Goods Warehouse;
- { Branch Store Building;
- { Allowance for Depreciation of Branch Store Building;
- { Transportation Equipment;
- { Allowance for Depreciation of Transportation Equipment;
- { Other Selling Equipment;
- { Allowance for Depreciation of Other Selling Equipment.

## ADMINISTRATIVE

- Office Site;
- { Office Building;
- { Allowance for Depreciation of Office Building;
- { Office Equipment;
- { Allowance for Depreciation of Office Equipment.

In the case of a large scale enterprise the asset accounts would normally be subdivided for statistical purposes much further than as shown in the above outline. Not only would each distinct plant require a special group of fixed asset accounts but subsidiary accounts under each main head might be opened. The account, Transportation Equipment, for example, might control several subsidiary accounts such as Trucks, Horses, Wagons, etc. The scheme of using subsidiary and controlling accounts for the fixed assets may be carried very far in a particular case. The detail accounts may be collected in special asset ledgers, and a controlling account for each subsidiary ledger may be opened in the general ledger. Or the accounts in the

<sup>1</sup> The relation between a valuation account and the corresponding main asset account is indicated by a brace in each case,

general ledger may control in each case one or more accounts in each of the special ledgers. In the above outline, for example, all of the accounts mentioned could evidently be classed under the three general accounts, Land, Buildings, and Equipment, and the corresponding valuation accounts. In railroad accounting the "Classification of Investment in Road and Equipment" prescribed by the Interstate Commerce Commission is divided into three "general" and seventy-seven "primary" accounts. (See Chapter XXXI.)

It should be noted that the division of asset and other accounts in special books according to phases and departments of the business is desirable not only in that it makes it possible for the manager (or anyone interested) to derive much more information of importance from the accounts, but also in that it permits of specialization on the part of the clerical force working on the books. This is a practical necessity in cases where a large staff of bookkeepers and similar help is employed.

In functional classification — as in all other divisions — certain cases arise in which it is difficult to assign the assets to particular groups of accounts on a rational basis. For example, the same transportation equipment may be used to haul both raw materials and finished goods. In such a case it is not easy to apportion the value of this equipment — on any but an arbitrary basis — between the manufacturing and selling departments. But in large scale enterprises — where the equipment is highly specialized — such classification can be easily carried out, and may be very extensive indeed. There are also certain necessary outlays during the period of construction which are applicable to the property as a whole but not to any specific tangible result, and which, therefore, cannot well be distributed in the accounts on a functional basis. (See Chapter XIX.)

Another important line of division between fixed asset accounts arises in cases where several products are being produced by a single enterprise. In such cases the ideal arrangement would be the segregation in a special group of accounts of the fixed investment devoted to the production of each type of commodity or service — with further classification according to phases of the business process as suggested in the above outline. Wherever the same property units are used to produce several

products, however, the determination of the investment required for each line is a problem practically impossible of rational solution. A railroad company, for example, sells both passenger and freight service but practically the same right-of-way, roadbed, and track are used for both types of traffic. It would therefore seem a very unreasonable procedure to attempt to apportion the investment in "road" between the two services. Yet the central problem of cost accounting is the classification of "costs" or expense according to commodities or services produced; and this virtually involves just such an assignment of investment.

It should be evident that all possible transactions which might affect the subsidiary fixed asset accounts as presented in a detail classification would be analyzed according to the general principles illustrated in the preceding sections of this chapter. If the asset accounts of an enterprise are numerous, however, greater care must be exercised in determining the particular account which is to be charged or credited as the case may be.

#### ACCOUNTS WITH CURRENT TANGIBLE ASSETS

The general distinction between fixed and current assets has already been considered. Summing up the discussion of this matter it may be said that liquidity and length of life are the important factors to be recognized. Length of life may refer to either of two conditions: (1) the rate with which an asset expires (or passes into the expense category); (2) the period during which an asset of almost constant value (such as a contractual right) is held by a particular enterprise. It should also be remembered that certain kinds of assets may be either current or fixed depending upon the nature of the enterprise possessing the asset in any case. The factory site of a manufacturing company, for example, is a fixed asset. A similar parcel of land held by a real estate company, on the other hand, constitutes a current asset — the merchandise of the enterprise. In this section the important classes of accounts with current tangible assets will be discussed.

a. First under this head will be considered the accounts which represent items such as materials, merchandise, goods in process, finished goods, fuel, stationery, and other types of current sup-

plies and commodities. Such accounts present no peculiar problems of analysis (as compared with the accounts with tangible fixed assets) except in the cases where a current asset and a revenue are included in the same account. As already explained, the account, Merchandise, as often used by a trading company, is a mixed account, representing both asset and equity elements. The accounts Materials, Goods in Process, and Finished Goods, however, which are used in factory accounting, can be considered as typical asset accounts; for in these cases cost prices and selling prices are not entered in the same account, and special accounts, such as Sales, are used to show gross revenue. The difference between these two cases will be further explained in Chapter VIII.

Many transactions affecting such accounts occur in business practice. A large number of the purchase and sale happenings which furnish the bookkeeper with the major part of his routine work have to do with the current assets. This follows naturally from the nature of these items. And, although current assets remain in the business for a comparatively short period, significant value changes may occur in such assets. Raw materials and similar items may appreciate or depreciate, and the depreciation in such cases may be due either to price declines or to physical deterioration. Obsolescence is also a possible cause for the depreciation of some current assets. Merchandise, for example, may decline in value because of seasonal or permanent changes in the character of demand. Normally the period in which a specific item remains in the business is so short as to make it impracticable to attempt to show these changes in the asset accounts. The clerical labor involved would be too great, and the correction automatically occurs when the item is sold and other property received in exchange. But when the period of turnover is abnormally long, or if a serious change in price occurs, it becomes desirable to make the necessary adjustments directly in the asset accounts. Valuation accounts can be used in recording the decreases in value due to depreciation, as in the case of fixed asset accounts, or the asset account can be credited directly with the amount of the expiration in any case.\*

Then debits to the Materials account of the A. B. Co., for example, will represent, normally, the cost of materials purchased. Credit entries in this account will usually represent the value of

materials taken from the warehouse and turned over to the factory operatives. Yet if it be assumed that it is the function of this account to show the actual value of the materials on hand, any significant advance in the prices of these materials would also give rise to a debit entry for the amount of the increase, and any decline in the value of units not consumed would require a credit entry (or a credit entry in a valuation account).

In the case of an enterprise doing a trading as well as a manufacturing business credits to the Materials account might (in addition to the occurrences already mentioned) represent the sale of materials at cost, at a loss, or above cost. If the entire amount of each sale were credited to Materials in such a case, this account would become a mixed account. If a perpetual inventory were kept, however, the credit entries recognizing such sales could be restricted (as far as Materials were concerned) to the amount of the asset subtraction in each case. In this event the Materials account would retain its character as an asset account.

The following transactions illustrate the various important cases :

1. Materials are purchased for cash, \$1,000. The transaction would be journalized as follows :

Materials . . . . .	\$1,000	
Cash . . . . .		\$1,000

This is a typical occurrence.

2. Materials are taken from the warehouse to be used in manufacture. The entries would be :

Goods in Process . . . . .	\$500	
Materials . . . . .		\$500

This is another normal transaction. Credits can be made to the Materials account whenever any materials whatever are removed, or these credits may be made only at certain intervals.

3. It is estimated that materials on hand have decreased in value because of deterioration and unfavorable price changes, \$500. The journal entries would be :

Expense . . . . .	\$500	
Materials . . . . .		\$500

4. Materials are sold at cost for cash, \$300. The journal entries covering this situation would be :

Cash . . . . .	\$300	
Materials . . . . .		\$300

If these goods were sold at an advance of \$50, the entries (assuming a perpetual inventory) would become :

Cash . . . . .	\$350	
Materials . . . . .		\$300
Revenue . . . . .		50

If the sale were below cost, \$50, the entries would be :

Cash . . . . .	\$250	
Expense . . . . .	50	
Materials . . . . .		\$300

If the entire amount of the sale were credited to Materials in each case it would mean, as explained above, that the Materials account was being used as a mixed account.

The accounts with tangible current assets may also be classified on a functional basis. Thus, instead of one Materials account, an enterprise may make use of several such accounts — an account for each type of raw materials or a special account to represent the value of the raw materials to be devoted to each particular product. But although the current asset accounts may represent an important part of a firm's investment, if a functional classification of *expense* accounts is carried out there is little advantage in classifying current assets on this basis, since specific asset items rapidly pass into the expense category.

b. Among the accounts with current tangibles Cash is sufficiently important and peculiar to be given special consideration. Cash is an account found almost universally. Being the accepted legal tender cash is necessary in nearly all types of business operations. (Checks, money orders and bank drafts, as well as actual currency, are commonly considered as cash when received or given.) It is the most liquid form of property. Be-

cause of its availability as a purchasing and debt-paying medium cash is in some ways the most desirable form of property. In accounting, however, the tendency is to lay too much stress upon the importance of cash, and transactions involving cash. Although cash is an important asset, for the reasons just given, the Cash account is not the most important or informational account in many cases.

The chief peculiarity of Cash lies in the fact that normally none but actual "business" transactions affect this account. Exceptions to this normal condition arise in the case of lost or stolen cash and gifts. Further, if the gross amount of checks and drafts is charged to Cash and exchanges and other deductions (such as a tax on checks) are later allowed, such items require credits to Cash for the amounts involved. Depreciation and appreciation do not usually occur in connection with cash. The value (or purchasing power) of the dollar varies, but this does not appear in the Cash account since the dollar is itself the measuring unit which is applied to all other values.

Transactions (1) and (4) under (a) above illustrate ordinary occurrences affecting the Cash account. In the case of donations, or lost or stolen cash, Cash would be credited and Expense debited (Expense if the outlay or loss is of ordinary occurrence, Net Revenue or Surplus if the expiration is unusual and can commonly be avoided). Changes in the Cash account also arise in transactions involving concurrent changes in equity and subsidiary equity accounts. The following transactions are illustrative of such cases:

1. A invests cash in business, \$5,000. The following journal entries would be made:

Cash . . . . .	\$5,000	
A, Capital . . . . .		\$5,000

2. A promissory note against the enterprise amounting to \$500 is paid. The entries would be:

Notes Payable . . . . .	\$500	
Cash . . . . .		\$500

3. Product is sold for cash, \$200. The entries would be as follows:

Cash . . . . .	\$200	
Revenue . . . . .		\$200

4. The Net Revenue account at the end of the year shows a credit balance of \$1,200. A withdraws this amount in cash. Entries:

Net Revenue . . . . .	\$1,200	
Cash . . . . .		\$1,200

5. The bank charges the firm's account with \$3, the amount of exchange on drafts and notes deposited. The entries on the firm's books (assuming that the gross amount of checks and drafts were charged to Cash as received) would be:

Exchange . . . . .	\$3	
Cash . . . . .		\$3

The charge to the Exchange account in this case would represent a deduction from revenue (assuming the funds involved were received from sales) with approximately the same significance as an item of cash discount on sales.

The large part of a firm's cash is usually deposited with some bank. In such a case the firm's bank book shows (in summary form) the same information as the Cash account in the ledger. The ledger account is sometimes considered as representing the bank's relation to the enterprise rather than a tangible asset, cash, and is entitled with the name of the bank. Indeed it should be recognized that the medium used in modern business transactions consists essentially in rights against banks rather than tangible coin or other forms of currency. Cash, then, is not usually an asset represented by a tangible object in the same sense as is raw material. Nevertheless the claims represented by a Cash account in any case can normally be converted into currency on demand.

It is usually necessary to keep some cash on hand from which to make small payments. Such cash is recorded in a "Petty Cash" account. Sometimes a petty cash book, or journal, is also kept. In some cases all funds received are first deposited, and then checks are drawn at intervals to secure the funds needed for small payments. If disbursements are made from the till before all



receipts are deposited a record of such items is, of course, necessary. In most businesses safeguards of all sorts are thrown around the Cash account so as to prevent defalcations. In some cases an inordinate emphasis is placed upon such arrangements in view of the neglect of other important matters. A theft or loss of supplies to the amount of \$50 is nearly as serious a matter as a misappropriation of cash for a like amount.

#### ACCOUNTS WITH CURRENT RIGHTS

a. First under this head may be grouped the accounts which represent current rights to contractual sums against other individuals and enterprises than the firms on whose books such accounts appear. Notes Receivable and Accounts Receivable are the common examples. In the typical trading or manufacturing enterprise such assets as notes and accounts receivable arise largely through the sale of merchandise or finished goods on other than a cash basis. Usually, then, an account receivable is a "book" claim against a customer which represents the fact that goods have been shipped to the customer and that payment has not yet been made. The correspondence between firm and customer, and original papers such as the bill of lading, furnish evidence of the authenticity of the sale and the validity of the account. A note receivable, likewise, is usually a claim against a customer, consisting, however, in the customer's written promise to pay a certain sum, with or without interest as the case may be, at a specified date. Such an instrument may be given at the time a sale is made, or later, to settle an open account.

Accordingly Accounts Receivable (as well as the customer's personal account) is charged, and the Sales account is credited, with the amount of each credit sale. Whenever an account is paid Accounts Receivable is credited for the amount of the payment. If a discount is allowed at the time of payment the amount of the discount, as already explained, constitutes a deduction from the revenue previously credited to the Sales account, and hence is chargeable either to that account or to a special offset account. In such a case the gross amount of the original charge, rather than the amount paid, is credited to Accounts Receivable. Notes Receivable is charged with the face amount

of such instruments received, and is credited with corresponding amounts when the notes mature and are paid. Transactions affecting these accounts — particularly Accounts Receivable — are naturally of very common occurrence in the case of the ordinary enterprise.

These accounts present some peculiarities. Appreciation of such assets as notes and accounts receivable is practically impossible, for these assets are current in character and represent contractual amounts. Depreciation of current rights, however, often occurs. In the case of nearly every business enterprise a more or less considerable subtraction from the face of the accounts receivable must be made at intervals to represent the estimated amount of uncollectible accounts. It is common practice to credit another account, Allowance for Uncollectible Accounts, for such amounts, in lieu of Accounts Receivable. Such an account is a subsidiary valuation account similar to Allowance for Depreciation of Buildings. It is particularly important that Accounts Receivable should show original figures, for, as explained in a preceding chapter, a subsidiary ledger lies back of this account, and it is important, in any such case, that the account in the general ledger be allowed to retain its character as a controlling account. The entries involving valuations of accounts receivable will be illustrated in Chapter VIII. Particular notes may also depreciate or even prove to be entirely worthless. In such cases it is necessary to credit Notes Receivable and debit an expense account for the amount of the expiration.

The beginner often experiences some difficulty in making the entries involved in transactions which affect the Notes Receivable and Interest accounts. One or two illustrations will be given at this point.

1. Merchandise to the amount of \$1,000 is sold and a six per cent note for sixty days is received. The entries on the books of the firm making the sale would be :

Notes Receivable . . . . .	\$1,000	
Merchandise Revenue . . . . .		\$1,000

With fifty days yet to run the note is assigned to a bank without change in the rate of interest. The firm receives the face of the

note, \$1,000, and one-third of a month's interest, \$1.67. The entries covering this transfer would be:

Cash . . . . .	\$1,001.67	
Notes Receivable . . . . .		\$1,000.00
Interest . . . . .		1.67

These entries show an addition to an asset, cash, of \$1,001.67, and a subtraction from another asset, notes receivable, of \$1,000. The balance of the cash received, \$1.67, is a payment for capital-service furnished by the firm; and the credit to Interest represents this item of net revenue.

2. If the note received in the above transaction bore no interest, and were discounted at the bank fifty days from the date of maturity at six per cent, the entries would be quite different. A non-interest bearing note is not worth its face until the due date. It is banking practice to apply the stated rate of discount to the future sum instead of to the actual present principal. Since the bank in this case must wait fifty days for the note to mature, the face of the note would be discounted for this period at six per cent in computing the present value. The entries on the books of the firm disposing of the note would then be:

Cash . . . . .	\$991.67	
Discount . . . . .	8.33	
Notes Receivable . . . . .		\$1,000.00

The discount in this case is a valuation item. The note is not worth its face. The credit to Merchandise Revenue — in (1) above — was overstated, and the discount item is essentially a deduction from the nominal revenue figure.

Firms handling but small amounts of commercial paper commonly ignore the distinction between discount and interest, and include all such items in one account. While this procedure is inaccurate it is not a matter of great significance where the amounts involved are small. Banks and similar enterprises, however, find it necessary to distinguish carefully between the two cases. Discount is "future" interest; that is, it becomes interest as the date of maturity for the instrument involved approaches. In Part Three of the text the problems of compu-

tation and analysis involving interest and discount will be fully discussed.

If the firm negotiating a note endorses the instrument — that is, becomes responsible for its payment in case the original maker, or previous endorser, fails to meet the obligation when it matures — the note represents a *contingent* liability of the firm. Undoubtedly a record of this fact should be made in any case, but it may not be desirable to attempt to show this information in the regular ledger accounts. An attempt is sometimes made to crowd into the accounts proper data which are somewhat extraneous. The point should be emphasized again that there is much statistical information pertaining to a business enterprise which does not belong in the accounts. Strictly speaking, only asset and equity facts — or facts which represent phases of these classes — are proper matters for accounting record. In preparing financial statements, however, the accountant — particularly the auditor — often makes use of auxiliary information.

If such a contingent liability is shown in the accounts it is desirable to set it up by crediting Notes Receivable Discounted, instead of Notes Receivable, with the amount of all discounted paper. Thus, in (2) above, the entries would be:

Cash . . . . .	\$991.67	
Discount . . . . .	8.33	
Notes Receivable Discounted . . . . .		\$1,000

Such an account represents a special case of subtractions from the notes receivable, and suggests the contingent character of these subtractions. The use of contingent items in balance sheet statements will be explained in a later chapter.

Accepted bills of exchange are in effect promissory notes, and are usually carried in the Notes Receivable account. Until such an instrument is accepted by the payer, however, it is good practice not to formally enter the transaction. Even if cash is received by the drawer immediately from his bank, it is desirable to simply make a memorandum to that effect, and omit the record of the transaction in the accounts proper until the notification that the bill has been accepted is received.

b. A final group of current asset accounts includes all accounts which represent short-term rights to *services*. Whenever pay-

ment for a service is made prior to the receipt or utilization of the service, the amount of the payment represents a current asset. Prepaid insurance, advertising and rent are common examples of such assets. The accounts with such items are debited whenever the services which they represent are purchased. At intervals the expirations are recognized and transferred to expense accounts. Because such assets are highly transitory in character and contractual in amount the problems of valuation involved are particularly simple.

Whenever payment for a current service is made at the moment the service is consumed, or later, the account representing the service can be considered an expense account as explained in Chapter III. In general it may be said that this group of asset accounts "shades into" the expense accounts. The payments for services such as insurance, however, are normally made in advance and cover a considerable period.

The following transactions illustrate the important possibilities:

1. The firm decides to run an advertisement for three months in a local newspaper. A payment for the three months' advertising service is made, \$300. The entries are as follows:

Advertising . . . . .	\$300	
Cash . . . . .		\$300

2. An inventory is taken a month later, and the expiration of advertising service is entered thus:

Expense . . . . .	\$100	
Advertising . . . . .		\$100

3. If the service were paid for after being consumed, and had not previously been recognized in the accounts, the entries would become:

Expense . . . . .	\$300	
Cash . . . . .		\$300

The transactions discussed in this chapter illustrate adjustments which are made in connection with inventories and appraisals as well as entries resulting from ordinary purchase and

sale happenings. The fact has been emphasized that, as far as the effect upon the asset account in any case is concerned, a value change in either direction due to a revaluation of remaining units is as significant as a change due to the addition or subtraction of specific units. No attempt has been made to discuss the technical process of balancing the accounts and making closing entries after the valuations are made. This topic will be considered in Chapter VIII.

## VII

### FURTHER CLASSIFICATION OF EQUITY ACCOUNTS

THE equity accounts of a business enterprise, as already explained, represent the facts of ownership. It is the function of these accounts to show the actual investment of each interest furnishing capital to the enterprise, and to reflect the changes in equities due to the variations in asset values resulting from normal operating conditions and other causes. In this chapter the equity accounts will be discussed under the following heads: (1) accounts with fixed equities; (2) classes of expense and revenue accounts; (3) net revenue and surplus accounts; (4) accounts with current liabilities.

#### ACCOUNTS WITH FIXED EQUITIES

As in the case of the assets, the equities in the business enterprise may be divided into fixed and current items. A particular equity may be of indefinite life, as is normally the case with proprietorship, or an equity may be a contractual right covering a specified period, short or long. In this section cursory consideration will be given to the accounts representing fixed (or "capital") equities.<sup>1</sup>

a. Accounts must be kept in each case to show the proprietor's equity — the original and accumulated proprietorship. As explained in Chapter II, the proprietor is the owner in the narrow sense. It is this interest that assumes, in large measure, the burden of risk and management and has a residual right to assets as income or principal. In an enterprise such as a small retail establishment, where nearly all of the capital is furnished by the "proprietor," it is the essential function of the financial records

<sup>1</sup> Part Two of the text is devoted to a more complete discussion of the proprietary and fixed liability accounts as they appear under different forms of organization.

to show proprietorship and the change in this equity which accrues during each period of operation. If outsiders furnish part of the capital in any case, however, accounts must also be kept with these equities, and the items of income accruing to such interests must be regularly recognized in the net revenue accounts. And in many large corporations the liabilities exceed proprietorship in amount. Yet even in such cases the final goal of accounting, in a sense, is the determination of proprietorship and proprietary income, or *profit*; for this equity, as just stated, is the *residual* interest. From the accounting standpoint, therefore, proprietorship is the most important equity in the business enterprise.

In a "single-proprietorship," or in a partnership, accounts headed with the name of the proprietor or the names of the different partners as the case may be, are commonly used to represent the proprietary equity. In the case of a corporation it is customary to consider this equity as being identical with the claims of the stockholders, which are represented by the capital stock and surplus accounts. This is a somewhat arbitrary conception of proprietorship, because of the impersonal character of this (or any other) equity under the corporate form of organization, and because of the marked differences in the rights represented by the various kinds of capital stock (see Chapter XII).

Capital stock is listed in the accounts at its par or formal value, and hence does not often exactly represent the original investment of the stockholders. A valuation account, Discount on Stock, should be used to record offsets to corporate proprietorship at the time of organization. Premium on Stock, or a similar account, may be used to represent the excess of the original proprietorship over the par of the capital stock in any case. Surplus, according to general usage, represents proprietary income retained in the business. This item, in practice, is represented by variously named accounts. Surplus, Undivided Profits, Profit and Loss, Loss and Gain, are the common examples. In addition to the general surplus account there may be special accounts which represent in each case a portion of surplus appropriated for a particular purpose. Examples of such accounts are Sinking Fund Reserve and Reserve for Improvements. (See Chapter XIII for a special discussion of surplus appropriations.)



The fixed proprietary accounts are credited with all investments and all net proprietary earnings which are not immediately distributed, and are charged with all withdrawals and all net losses. The transactions directly affecting this group of accounts are made for the most part either at the time of organization or at the end of an accounting period, and hence cannot be explained in detail until the process of closing the accounts has been discussed. In these accounts, as in all equity accounts, debits always indicate subtractions, and credits always indicate additions.

The following are illustrations of a few typical transactions :

1. The subscribers pay in \$10,000 in cash, and stock is issued to them for this amount. Entries :

Cash . . . . .	\$10,000	
Capital Stock . . . . .		\$10,000

2. The above stock is subscribed at \$90 per share, par \$100. The subscriptions are paid and the stock is issued. In summary form the entries would be as follows :

Cash . . . . .	\$9,000	
Discount on Capital Stock . . . . .	1,000	
Capital Stock . . . . .		\$10,000

3. The same as (2) except that the stock is subscribed at \$110 per share. Entries :

Cash . . . . .	\$11,000	
Capital Stock . . . . .		\$10,000
Premium on Capital Stock . . . . .		1,000

4. The amount of net revenue accruing to the stockholders, \$1,000, is transferred to Surplus, thus :

Net Revenue . . . . .	\$1,000	
Surplus . . . . .		\$1,000

5. An appropriation of \$3,000 as a reserve for improvements is made by the directors. This transaction involves simply a subtraction from a general surplus account and an addition to a special surplus account. The entries accordingly would be :

Surplus . . . . .	\$3,000	
Reserve for Improvements . . . . .		\$3,000

b. In practice all long-term equities other than proprietorship constitute the capital liabilities of an enterprise. Notes payable (long-term notes), mortgages, bonds, and similar securities are the common examples of such equities. These items represent *contractual* rights to income and principal, and hence seldom increase because of invested earnings or decrease because of losses.<sup>1</sup> As in the case of capital stock, the par or face of a fixed liability may be more or less than the actual investment. Accordingly a special account is necessary for such a case to show the amount of discount or premium.

Since the fixed liabilities are contractual, debits in the accounts with such items usually indicate subtractions due to the payment of the obligation in any case with some kind of property (normally cash), or to the exchange of one equity for another. Similarly, credits indicate additions made concurrently with the receipt of property or a corresponding reduction in another equity. The Mortgages Payable account, for example, would be credited with the amount of all mortgages issued and charged with the amount of all mortgages retired. These entries would normally cover the contractual sums specified in the mortgage contract. Only in the case of liquidation or reorganization would it be necessary to make entries in such an account for any deductions from the contractual amounts.

The following transactions illustrate the ordinary cases:

1. Bonds are issued for cash at par, \$10,000. Entries:

Cash . . . . .	\$10,000	
Bonds Payable . . . . .		\$10,000

2. The bonds mentioned in (1) are retired with cash, \$10,000. The entries would be the reverse of the above:

Bonds Payable . . . . .	\$10,000	
Cash . . . . .		\$10,000

<sup>1</sup> The amortization of premiums and the accumulation of discounts may be thought of as representing decreases and increases, respectively, in bondholders' equities. These transactions are complex and will be discussed in a later chapter.

3. Mortgages to the amount of \$10,000 are retired and bonds are issued in exchange for the same amount. The entries would be:

Mortgages Payable . . . . .	\$10,000	
Bonds Payable . . . . .		\$10,000

4. Bonds, par \$10,000, are issued at a premium of ten per cent. Entries:

Cash . . . . .	\$11,000	
Bonds Payable . . . . .		\$10,000
Premium on Bonds . . . . .		1,000

5. Bonds, par \$10,000, are issued at a discount of ten per cent. The entries on the issuing corporation's books would be:

Cash . . . . .	\$9,000	
Discount on Bonds . . . . .	1,000	
Bonds Payable . . . . .		\$10,000

#### CLASSES OF EXPENSE AND REVENUE ACCOUNTS

Expense and revenue accounts, as explained in Chapter III, are subsidiary equity accounts. Revenue accounts are credited with all sales of product — gross additions to equities. Expense accounts are charged with the amount of all services and commodities consumed — deductions from revenue. The net result of these two groups of accounts is the *net revenue* (or *net loss*) from operations for a given period. In other words it is the function of the expense and revenue accounts to present an exhibit of the productive process for *each accounting period*, and to show the net effect of that process upon the status of the equities — particularly proprietorship.

A simple illustration will serve to emphasize further the general significance of these subsidiary accounts. A particular firm, it may be assumed, makes use of the following accounts with expense and revenue items: Materials Expense; Fuel Expense; Labor Expense; Depreciation Expense; Sales of Product; and Rent Revenue. The relation between these accounts can be shown thus:

EXPENSE AND REVENUE

Materials Expense	Sales of Product
Fuel Expense	Rent Revenue
Labor Expense	
Depreciation Expense	

The net balance of these accounts for a given period is the amount which is carried to the Net Revenue account. If expenses exceed revenues the difference will be a charge to Net Revenue; if revenues are in excess the difference is a credit to Net Revenue. The Net Revenue account will then show the amount available for distribution among the various equities.

The following occurrences illustrate transactions affecting the expense accounts:

1. An appraisal shows that the company's buildings have declined in value, \$1,000. This transaction would be journalized as follows:

Depreciation Expense . . . . .	\$1,000	
Buildings . . . . .		\$1,000

2. Fuel has been consumed during the month, \$200. Entries:

Fuel Expense . . . . .	\$200	
Fuel . . . . .		\$200

3. Labor services are purchased and utilized to the amount of \$300. The journal entries would be :

Labor Expense . . . . .	\$300	
Cash . . . . .		\$300

4. Materials have been utilized, \$500. The entries would be as follows :

Materials Expense . . . . .	\$500	
Materials . . . . .		\$500

The following transactions involve credits to the revenue accounts :

1. Goods are sold for cash, \$500. Entries :

Cash . . . . .	\$500	
Sales of Product . . . . .		\$500

2. The firm receives a month's rent, \$100, for the use of a part of its building. The entries would be :

Cash . . . . .	\$100	
Rent Revenue . . . . .		\$100

Further illustrations of transactions involving expense and revenue items will be given in the next chapter.

It is evident that as far as the integrity of the net revenue figure is concerned in any case all expense and revenue items might be listed in the debit and credit columns, respectively, of a single account. If there were no omissions or other errors the net result would be the same as it would be if a large number of distinct accounts were used. (In any case such a summary account is a convenient device, and its use will be explained in Chapter VIII.) The point should be emphasized at this stage, however, that the detail classification of expense and revenue accounts for managerial purposes is one of the most important matters in modern accounting. Brief consideration will be given to this topic in this section.

In the case of an enterprise of any complexity it is not sufficient that total expense and total revenue be correctly shown in the accounts. The net earnings of the business can be determined

by combining these figures, and a rough test of efficiency may be had by comparing the expense and revenue totals in a particular period with the corresponding figures for preceding periods. But the management should have at its disposal much more elaborate information than this. As far as possible all the expenses applicable to each important department or phase of the business should be segregated in the accounts. Further, the expenses incident to the use of each important type of fixed asset and each current service or commodity might well be grouped in a special account. Only from such classifications of expense accounts is it possible for the manager to secure the data necessary for making comparisons to determine the relative efficiencies of particular plants, departments, processes, etc., and in fixing the responsibilities of employees.

Still further, if a firm is producing several products it is highly desirable that the expenses incident to the production of each line, in so far as they can be isolated, should be charged to a special group of expense accounts. An enterprise may discover, for example, after making such a functional analysis of expense charges, that a particular product is being manufactured at an actual loss although the business as a whole has been making a fairly satisfactory showing. In such a case, obviously, net earnings can be increased by further specialization. The essential problem of cost accounting, as will be explained in Chapter XXIX, is the classification and distribution of expense charges in the accounts of an enterprise in such a way as to reveal the actual cost of each important product.

The following is an illustration of a simple classification of expense accounts for a manufacturing enterprise :

#### **MANUFACTURING**

- Maintenance of Factory Building ;
- Depreciation of Factory Building ;
- Maintenance of Factory Equipment ;
- Depreciation of Factory Equipment ;
- Maintenance of Transportation Equipment ;
- Depreciation of Transportation Equipment ;
- Materials Expense ;
- Factory Supplies ;
- Wages of Operatives ;

Superintendence ;  
Wages of Drivers ;  
Wages — Miscellaneous ;  
Fuel Expense ;  
Inward Freight ;  
Power and Light ;  
Miscellaneous Factory Expense.

#### SELLING

Maintenance of Warehouse ;  
Depreciation of Warehouse ;  
Maintenance of Equipment ;  
Depreciation of Equipment ;  
Supplies ;  
Salesmen's Salaries ;  
Wages of Shippers and Packers ;  
Miscellaneous Wages ;  
Traveling Expenses ;  
Heat and Light ;  
Outward Freight ;  
Advertising ;  
Other Selling Expense.

#### GENERAL

Maintenance of Office Building ;  
Depreciation of Office Building ;  
Depreciation of Office Equipment ;  
Office Supplies ;  
Salaries of Clerical Force ;  
Heat and Light ;  
Officers' Salaries ;  
Insurance ;  
Taxes.<sup>1</sup>

It is evident that, in apportioning expense charges between departments and phases of an enterprise, difficulties arise similar to those mentioned in the preceding chapter in the discussion of the functional classification of the accounts with fixed assets. The power plant in the factory building, for example, may be

<sup>1</sup> There is some question as to the legitimacy of considering taxes an expense. In the next section of this chapter this problem will be briefly discussed.

used to furnish heat and light to the warehouse and office building as well as to the factory. In such a case the distribution of fuel expense and other charges incident to the operation of the power plant between the three main classes of expense accounts shown above on any but an arbitrary basis is obviously a difficult matter. Similarly, the same transportation equipment in a particular case may be used indiscriminately to haul raw materials from the freight depot and to deliver finished goods to the railroad company or directly to a customer's warehouse.

When it is further attempted to classify expenses in terms of costs incident to the production of each important type of product in any case, added difficulties in analyzing particular expenditures are encountered. Many classes of current services and commodities are normally utilized in the production of more than one line. A particular type of skilled labor, for example, — or even specific laborers, — may be employed at different times upon work connected with several products. Further, the fixed assets are usually much less completely specialized than the current assets. A single factory building, for example, may be used in the production of several distinct lines of goods. Obviously, in such a case, the maintenance and depreciation charges applicable to the building must be distributed in the expense accounts on a rather arbitrary basis.

The revenue accounts will normally be fewer in number than the expense accounts. An enterprise usually buys a long list of commodities and services even if but a single type of commodity or service is produced. And although a functional classification of revenues is an important matter in the case of an enterprise manufacturing or handling several lines, it does not present the difficulties that arise in distributing expense charges on a similar basis. In the case of a retail drygoods company, for example, while it might require considerable clerical labor to ascertain the exact amount of the sales of each kind of goods handled no difficult problems of analysis would arise. It would be necessary simply to follow actual business transactions as they appeared on the sale slips or other records. In such a case it would not be expedient, however, to set up a special revenue account with each minor type of commodity sold. The inconvenience of such a system would more than offset its advantages. But each im-



portant class of sales might well be credited to a special revenue account.

The following list illustrates a possible classification of revenue accounts for a company manufacturing agricultural implements and doing a wholesale business in certain kinds of tools and other hardware supplies as well :

#### IMPLEMENTS

Sales of Binders ;  
Sales of Wagons ;  
Sales of Hay Loaders and Tedders ;  
Sales of Mowers ;  
Sales of Cultivators and Harrows ;  
Sales of Drills and Seeders ;  
Sales of Other Implements.

#### HARDWARE

Sales of Carpenters' Tools ;  
Sales of Hardware Supplies.

#### OTHER REVENUE

Rent of Offices ;  
Royalties.

It can readily be seen that the expense and revenue accounts of a large and complex enterprise, if classified in any detail, may be very numerous indeed. The classification of operating revenues and operating expenses of steam roads prescribed by the Interstate Commerce Commission in 1914 contains about two hundred primary expense accounts (grouped under eight general heads) and thirty-nine primary revenue accounts (under four main heads). It should be recognized, however, that no matter how far the division of these subsidiary equity accounts be carried in any case, the relation of such accounts to the net revenue figure and to the balance sheet equities is the same as in the simple case where but one or two accounts are used.

## NET REVENUE AND SURPLUS ACCOUNTS

The general relation of the Net Revenue and Surplus accounts to the balance sheet classes was explained in Chapter III; and several references have been made in the preceding pages to the possible use of these accounts to reflect variations in the values of fixed assets which arise outside of the normal course of business operation. In this section these matters will be briefly reviewed, and some consideration will be given to the important types of subsidiary net revenue and surplus accounts.

The most important function of the general Net Revenue account in any case, as already explained, is to show the net result of the expense and revenue accounts for a particular period, or, in other words, the net revenue figure, and the apportionment of this amount among the various equities in the enterprise. This account is therefore credited with the amount of net revenue and is debited with all accruals to the contractual equities and all distributions of proprietary income. Further, items of net income arising from extraordinary causes and from ancillary operations may be credited to this account; and unusual deductions from ownership, analogously, may be charged to Net Revenue. The balance of this account, if a credit amount, represents proprietary earnings allowed to remain in the business, and may be credited to Surplus. If a debit amount this balance represents a decrease in proprietorship and hence constitutes a charge to the Surplus account.

If the assets of an enterprise are represented by a single equity one account will suffice to show the distribution and adjustment of the net revenue figure. If there are several distinct equities involved a separate account with each equity may be desirable. The most important general distinction in this connection is between accounts representing accruals to contractual equities (interest) and those which show the distribution of proprietary income (dividends, for example). Further, net losses and gains, and items of net income such as interest and dividend accruals on securities owned by the enterprise, may be set up in special accounts. All such accounts are subsidiary net revenue accounts; and their relation to the general Net Revenue account can be shown thus :

## NET REVENUE

Net Operating Deficit		Net Operating Revenue	
Losses		Gains	
Interest		Interest	
Dividends		Dividends	

The Dividends account represents either appropriations and distributions to the proprietors of an enterprise (stockholders in the case of a corporation), or additions to net revenue received as income from securities held in other enterprises. Dividends received are net rather than gross revenue because such items represent income resulting from the sale of the service of ownership itself, and consequently no expirations of capital (supposedly) are involved. Similarly the Interest account shows either the distribution of net revenue to the contractual equities or net revenue accrued as a result of the ownership of such rights. In the case of a corporation having outstanding a variety of contractual liens and securities as well as several classes of stocks a considerable number of such subsidiary net revenue accounts may be employed.

Although in general the distinction between the expense and revenue and the net revenue accounts is clear, there are certain

accounts which may, with some reason, be classed in either group. The account which shows tax accruals in any case, or the relation of the enterprise to the state, is one of these liminal cases. As pointed out in Chapter I the rights of the private equities in the assets of a business enterprise are always subject to revision by the tax power of the government. The state's right constitutes a prior lien on assets, and in the case of the general property tax this right is exercised whether earnings exist or not. Normally, however, the earnings of an enterprise are more than sufficient to offset all tax accruals. Now it would seem that tax payments or accruals can hardly be considered as items of expense. Expense charges are deductions from revenue which arise because of the expiration of services and commodities in business operation, and any service which the state furnishes to the business enterprise can hardly be conceived as a specific valuable consideration from the accounting standpoint. The service is too vague, and usually does not vary in proportion to the size of the tax levy. The payments are coerced, and are not analogous to market prices for definite services or commodities. On the other hand, payments to the government cannot, with entire propriety, be considered as distributions to an equity since the state's claim does not appear upon the books except as it is entered as an accrual from time to time. This is one of those questions that cannot be decided arbitrarily according to general principles. Either viewpoint may be legitimate under certain circumstances. It depends upon the immediate use that is to be made of the accounts involved in any case. From the manager's standpoint taxes are not an expense charge, for he is in no way responsible for the outlay. From the standpoint of the investor such payments have essentially the same significance as wages or any other expense, since the amount of such charges must be deducted before the sum available for distribution among the private equities is determined. On the whole the view that the Taxes account is a subsidiary net revenue account seems the more logical opinion. Further attention to this difficult point will be given in a later chapter.

Rent charges and credits are sometimes confused with net revenue items. While such entries represent contractual accruals it does not follow that the Rent account is in the net rev-

*enue category.* A firm, for example, leases a part of its building to outside interests. How are the payments to the firm to be considered? Clearly these are items of gross revenue, because depreciation and other expenses are involved in the production of this revenue. Rent, or hire, usually amounts to ten per cent or more of the value of the property leased. Only from a third to a half of this amount is net revenue. Further, rent expense is not a disposition of net revenue, but is a genuine expense. When a firm leases an asset from an outside party the payment it makes (assuming payment to be made in advance) represents the purchase of a definite privilege or service. As this service expires the amount of the expiration becomes an expense charge. This situation is analogous to the purchase and expiration of any asset. If payment is made after the utilization of the service the amount of the payment can be considered an immediate charge to an expense account. One might as well say that merchandise revenue (gross sales) before the deductions are made is *net*, as to consider the typical rent accrual as a net charge or credit to the equities.

The use of the Surplus account to represent a part of the proprietary equity has already been explained. Since surplus arises primarily through the retention of profits in the enterprise in any case it is evident that the Surplus account will be credited with all net revenue balances which are not distributed among the private equities, paid to the state as taxes, or otherwise disposed of. Further, special deductions from proprietorship (losses) and extraordinary additions to this equity (gains) may appropriately be carried directly to Surplus rather than to the Net Revenue account.

As already suggested, a particular enterprise may make use of several special surplus accounts. The relation between the general Surplus account and subsidiary accounts, positive and negative, is shown in the exhibit on page 147.

In the case of a single-proprietorship or a partnership the personal and capital accounts of the proprietors are usually directly charged or credited with items of deficit or surplus as the case may be. Small businesses may likewise dispense with an adjustment Net Revenue account. But in large enterprises, particularly under the corporate form of organization, several subsidiary

equity accounts are commonly necessary. In later chapters the Net Revenue and Surplus accounts will be considered in more detail. The general significance of these accounts, however, and the nature of their typical subdivisions, should be clearly recognized at this stage.

SURPLUS

Accumulated Deficit		Accumulated Profit	
Losses from Abandonments		Reserve for Improvements	

ACCOUNTS WITH CURRENT LIABILITIES

*a.* First under this head will be considered the accounts representing current claims against the enterprise which arise primarily through the purchase of materials or other assets on credit and through borrowings of current funds. The common examples are Notes Payable and Accounts Payable. The liabilities represented by such accounts constitute the floating indebtedness of an enterprise. That is, although such items are equities in the strict sense of the term, the holders of specific notes and accounts furnish the cash and other assets involved temporarily and not with the intention of allowing their capital to remain in this form. Consequently these claims do not represent investment as such. Nevertheless, although specific items may remain as equities for very short periods, the *total* of such liabilities on the books of a particular firm may represent continuously a significant sum. This means that in such a case a considerable fraction of the total assets of the business is represented among the equities by current liabilities, although the personnel of the holders of these claims is constantly shifting.

Credits to these accounts represent additions to the equities

involved, and debit entries indicate subtractions. Except in the case of insolvency or reorganization no deductions will ordinarily be made from current or other liabilities but such charges as represent the retiring of the obligation in any case with cash or an equivalent. As explained in Chapter IV, however, both accounts receivable and payable are often entered in the accounts at gross figures, and deductions are later allowed. Income does not accrue on book accounts, but even short-term notes may be interest-bearing as explained in the case of notes receivable.

The following transactions are typical of the occurrences affecting the accounts with these current liabilities:

1. Supplies are purchased on account from the S. Company amounting to \$400 at the gross billed price. The journal entries on the books of the purchaser would be:

Supplies . . . . .	\$400	
Accounts Payable . . . . .		\$400
(S. Company)		

2. A two per cent discount is offered on the account mentioned in (1) if cash payment is made within ten days. This discount is accepted. The entries would be as follows:

Accounts Payable . . . . .	\$400	
(S. Company)		
Cash . . . . .		\$392
Purchase Discounts . . . . .		8

Such a discount has the significance of a deduction from the cost of supplies, as was explained in Chapter IV.

3. If the above mentioned account were settled with a thirty-day, non-interest bearing note for \$400, the entries would be:

Accounts Payable . . . . .	\$400	
(S. Company)		
Notes Payable . . . . .		\$400

The Notes Payable account is often used to represent not only promissory notes but accepted drafts and bills of exchange drawn against the firm. Such instruments often draw interest at a specified rate. The following transactions illustrate happenings involving the Notes Payable and Interest accounts:

1. A sixty-day, six per cent note for \$500 standing against the firm is paid at the date of maturity, with interest. The interest, a deduction from net revenue, would amount to \$5 in this case. Accordingly the entries would be:

Notes Payable . . . . .	\$500	
Interest . . . . .	5	
Cash . . . . .		\$505

2. The A. B. Co. owes the Y. Co. \$500 for materials purchased. In full settlement of this account the A. B. Co. assumes a note in favor of the S. Co. and against the Y. Co. The face of the note is \$490; the interest rate is six per cent; the note runs for three months; and the date of assumption by the A. B. Co. is thirty days prior to the maturity date. The entries on the books of the A. B. Co. at the time the note is assumed would be as follows:

Accounts Payable . . . . .	\$500	
Notes Payable . . . . .		\$490
Interest Payable . . . . .		4.90
Purchase Discounts . . . . .		5.10

These entries recognize a subtraction from one liability, accounts payable, of \$500, an addition to another liability, notes payable, of \$490, and an addition to still another liability, interest payable, of \$4.90 (two months' accrued interest at six per cent). The difference between the book value of the new liabilities and that of the obligation retired is an allowance having the same significance as any purchase discount.

3. At the date of maturity the A. B. Co. pays the note described in (2) with three months' interest, \$7.35. The entries at this time would be:

Notes Payable . . . . .	\$490	
Interest Payable . . . . .	4.90	
Interest . . . . .	2.45	
Cash . . . . .		\$497.35

Other transactions involving promissory notes and interest and discount calculations and entries will be given in a later chapter.



b. Another group of accounts with current liabilities are those representing accrued items. The account, Interest Payable, shown in the above entries, is an illustration. Other examples are Wages Payable, Taxes Payable, and Rent Payable. These accounts represent rights of a still more transitory character. Such rights arise largely because of the familiar fact that the typical business enterprise utilizes services a few days or weeks in advance of payment for the same. Since such items are not recognized in the accounts except at the closing periods the treatment of these accrued liabilities in the accounts will be given in the next chapter.

## VIII

### CLOSING AND INTERPRETING THE ACCOUNTS

As the operation of an enterprise proceeds, the various business transactions occurring will be journalized and recorded in the accounts according to the principles developed in the preceding chapters. At certain regular times, however, the management (and other interests) will desire summary information concerning the firm's financial position and the events of the operating period just past. To furnish such information it is necessary to "close the books," and to prepare systematic statements exhibiting (1) the present status of the business and (2) the process by which this momentary condition is immediately attained. Although several references to closing and adjusting entries have been made in the preceding pages, no specific discussion of this important topic has been presented thus far in the text. In the present chapter the technical process of making such entries and closing the accounts will be described; and typical problems of interpretation that arise in this connection will be considered. The significance and preparation of the important financial statements will be discussed in Chapter IX.

#### THE TRIAL BALANCE

The first step in the process of closing the accounts is the taking of a *trial balance*. If the books have been properly kept by the double-entry system in any case there has been an equal debit entry (or entries) for every credit entry (or entries) and *vice versa*, as already explained. Consequently the total of all debits from the general ledger accounts should equal the total of all credits from these accounts. If this condition is found to exist the accounts are said to be "in balance," and it is then assumed that the bookkeeping work has been correctly performed. It is

in part to test this relation between aggregate debit and credit entries that the periodic trial balance is "struck." The trial balance is simply a summary transcript of the general ledger which shows total debits and total credits by "open" accounts (or debit balances and credit balances).

The following table illustrates such a statement:

TRIAL BALANCE OF THE A. B. Co.,  
August 31, 1918<sup>1</sup>

LEDGER PAGE	NAME OF ACCOUNT	Dr.	Cr.
2	Real Estate	\$ 40,000	\$
3	Buildings	70,000	
4	Equipment	24,000	
5	Materials	120,600	
8	Cash	57,900	31,700
16	Accounts Receivable	24,800	13,800
18	Notes Receivable	8,500	5,600
21	Securities Owned	5,000	1,000
23	Labor	8,540	
26	Fuel	600	
28	Insurance	250	
29	Miscellaneous Supplies and Services	800	
36	Sales Discounts	2,100	
38	Purchase Discounts		1,900
40	Sales		76,400
45	Rent		300
47	Commercial Interest	70	30
65	Capital Stock		170,000
67	Bonds		40,000
68	Notes Payable	6,300	15,000
75	Accounts Payable	11,200	24,030
		\$380,660	\$380,660

It is the function of the trial balance to furnish a test for clerical accuracy and to provide a convenient basis for the prepara-

<sup>1</sup> It should be noticed that this statement represents a purely hypothetical case. The accounts given do not conform to any satisfactory classifications for an actual business enterprise. They have been selected rather because they will serve as convenient illustrations in the discussion of the important questions of technique and interpretation that arise in the process of closing the accounts.

tion of the financial statements. Only the open ledger accounts are collected in such a statement, for any accounts which exactly balance obviously need not be included. A single general ledger account, however, will normally show either a debit or credit excess. That is, while the aggregate of the debit entries in all the accounts should equal the aggregate of credit entries in all accounts, a particular account usually presents a preponderance in one direction or the other. The nature of the account in any case determines which side will commonly show this balance. These net debit or credit balances may be carried to the trial balance, or total debits and total credits, as in the statement shown above. The latter procedure is probably the better, because a trial balance so constructed can be more easily interpreted than one which shows net balances only. If the totals from both debit and credit columns are used the bookkeeper's pencil footings, without combination, are carried to the trial balance.

The fact that the trial balance "proves" is not a positive proof of accounting accuracy, but only a fairly reliable indication. There is a chance that the same error has been made on both sides of the ledger. Further, this test cannot prevent errors in principle, or careless classification of the items involved in particular transactions. In recording the sale of merchandise for cash, for example, the bookkeeper may have charged Accounts Receivable instead of Cash; yet, as long as the amounts were correctly stated, the ledger would still be in balance. If the trial balance proves, however, it does show that there has been posted an equal debit entry (or entries) for every credit entry (or entries) and *vice versa*.

Although the trial balance is in principle a very simple device the actual process of taking such a statement is a matter of some clerical difficulty — particularly for beginners. It is easy to make small errors in computation and interpretation. Where special books such as the cash book are used, which combine a form of journal with one or more accounts, the accounts in these books — in so far as they do not appear in the general ledger — must be included. Further, it must be remembered that where controlling accounts are used, the controlling accounts and not the subsidiary accounts appear in the trial balance, though when preparing a trial balance the bookkeeper usually makes sched-

ules from the subsidiary ledgers and checks the amounts appearing in the controlling accounts from these schedules.

The arrangement of the accounts in the trial balance is not a matter of great importance. Usually this statement is prepared by following the ledger, page by page. Whatever scheme of classification — alphabetical or otherwise — that has been adopted in the ledger, therefore, will be duplicated in the trial balance. In the important financial statements which are prepared after the process of closing is complete, however, other bases of classification should be followed.

#### THE NECESSITY FOR INVENTORY AND APPRAISAL

The question now arises as to whether the trial balance — which is a summary of the ledger accounts — shows the financial condition of the business at a given moment of time. This question must be answered in the negative; and the explanation of this answer will serve to emphasize the fact already frequently referred to that the part played by the regular work of the bookkeeper in furnishing the data of the business process has very definite limitations. Purchase and sale transactions, and other actual business transfers and exchanges are, for the most part, recorded on the books as they occur. Expense and revenue *accruals*, however, are rarely so recorded. Such value changes are only recognized periodically when the accounts are closed and statements are prepared. At the moment the trial balance is taken, therefore, the ledger does not represent the exact status of the enterprise. It shows at this time simply a classification of the debit and credit entries posted by the bookkeeper to cover actual “business” transactions.

In the case of the typical enterprise, as already explained, it would not be expedient to attempt to record expense and revenue accruals in the accounts as they occur. It would be altogether too laborious and complicated a process as a rule to try to show in the Fuel account the subtractions due to the hourly or daily consumption of coal, for example. The more permanent property equipment is no doubt depreciating continuously; but it would not be feasible to present this fact continuously in the accounts. Thus the accounts do not show, currently, the ex-

pirations of assets due to the conditions of operation and the passage of time. The necessity arises for the inventory and appraisal. If some of the subtractions from assets are not immediately recorded in the accounts, inventories must be taken to determine the amount of each type of property actually on hand, and, consequently, the amount that has expired in any case. This sort of information is always necessary to supplement and correct the book records.

Further, current services and commodities are often received and utilized in one accounting period although payment is made in a succeeding period. In such a case it is evident that there will usually be no entries in the accounts representing these expired items for which payment has not yet been made. If the operating sheet is to cover all changes which have actually occurred within a given period, it will be necessary to recognize such accrued expense charges.

Similarly the actual amount of revenue that has accrued (that is, that has been *earned*) within a particular period may not be shown concurrently in the accounts. A firm, for example, owns some bonds in another enterprise on which interest is payable every six months. The regular time for closing the accounts, it will be assumed, is two months before the interest payment date. It will be necessary, therefore, in closing the accounts, to "accrue" the interest for four months.

It is evident that the net change in the equities, net revenue, cannot be determined until all accruals are taken into consideration. The amount of merchandise sales, for example, may represent gross revenue; but until all subtractions from assets have been charged to expense as a deduction from this figure the actual increase (or decrease) in the equities cannot be ascertained. The taking of inventories is therefore a matter of the utmost importance.

The shorter the accounting period the more closely the accounts will follow the actual situation. In general the year is the most significant fiscal period; and certainly the inventories should be taken and the accounts closed at least once each year. Some enterprises — for example, the railways — close their accounts and prepare statements once a month. This is a desirable procedure for managerial purposes. In the case of a business sub-

ject to seasonal fluctuations, however, the yearly statements furnish the most important general information.

The problems of valuation that arise in the actual process of taking inventories are many and difficult. The values of fixed assets such as buildings must be determined by *appraisals*; and, in view of the many factors affecting the values of these assets, the appraisals are often very difficult. Technical skill and knowledge of business conditions must be called into play in the appraisal of complex types of fixed assets. In the case of current assets such as raw materials, methods of *enumeration* and *measurement* can be followed to secure the physical inventory. The number of units multiplied by the value per unit gives the value inventory. The values of current rights such as notes and accounts receivable are determined by *estimation*. The integrity of the parties involved is the decisive factor in making such estimates. In the case of contractual accruals of rent and interest, the inventory figures are furnished by *computations* based upon a proper analysis of the relations involved. In the case of both fixed and current assets there is the added difficulty of determining a proper basis for valuation. Inventories may be based on either original cost, cost of replacement, present value to a "going concern," or liquidating or market value. This problem, which is the essential theoretical consideration involved in valuations, will be discussed in Chapter XX.

It is sometimes feasible in the case of materials, supplies, and similar assets to keep a perpetual inventory of the stock on hand. If materials placed in process are taken from the storeroom only upon properly authorized requisitions, an entry may be made in the Materials account each day to show the amount of materials transferred to Goods in Process. Even if a perpetual physical inventory is kept in the stock records, however, it is not always practicable to attempt to recognize in the ledger accounts the changes caused by such a continuous shifting of assets.

In this chapter attention will be given primarily to the actual process of closing the accounts, assuming the inventories to have been properly taken.

## CLOSING ACCOUNTS WITH FIXED ASSETS

As an illustration of the process of closing the accounts with fixed assets the Buildings account will be first considered. In the illustrative trial balance given in a preceding section this account shows a debit balance of \$70,000 on August 31st. Assuming the accounting period in this case to be a month, this balance represents the value of this asset at the beginning of the month of August plus any additions made during the month, less any subtractions for the period. Since total debits and total credits are shown in this trial balance it is evident that in the case of Buildings no subtractions from any cause whatever have been recorded during August. The management now decides, it may be assumed, that the buildings have declined in value during the month because of various causes one-half of one per cent; that is, an appraisal would now show a value of ninety-nine and one-half per cent of book value, or \$69,650. The expiration of property, therefore, or the depreciation expense as far as this asset is concerned, amounts to \$350. It is this latter amount that must now be subtracted from the asset account and be carried to an expense account. Assuming that the Buildings account is credited directly with this subtraction, this account, closed, would appear as follows:

## BUILDINGS

1918 Aug. 1		J2	70,000	1918 Aug. 31	Inventory	J96 ✓	350 69,650
			70,000				70,000
Sept. 1	Inventory	✓	69,650				

The amounts entered on the right-hand side of this account represent the closing computation. The credit of \$350 to Buildings represents a definite subtraction from an asset and requires a concurrent charge to an expense account. This transaction would, accordingly, be represented by a journal entry. The right-hand inventory figure, however, is not a subtraction but a *balancing* entry. (It is assumed that the enterprise in this case has



been in operation for only one month. This accounts for the reference to a journal page opposite the first left-hand entry in the above account. This \$70,000 figure then represents the charge to Buildings made when the account was opened. There have evidently been no purchases or other additions during the month.)

It is a desirable procedure to balance every account at the end of each accounting period so as to mark the separation of the periods sharply, and to show definitely the current status of each item. In bookkeeping practice a balance is taken by adding the amount of the balance in each case to the opposite side of the account. In this way actual subtraction — in the accounts at any rate — is avoided. The left-hand inventory figure cancels the fictitious entry on the opposite side, and shows the actual balance on hand, September 1st. Since these inventory entries have no effect upon Buildings or any other account they do not represent a transaction and therefore need not be journalized.

In theory the closing entries must be made and posted before the account is balanced. If a special account, Depreciation Expense, were now opened these entries would be as follows :

Depreciation Expense . . . . .	\$350	
Buildings . . . . .		\$350

Or a still more highly specialized expense account, Depreciation of Buildings, might be charged instead of Depreciation Expense.

A valuation account, Allowance for Depreciation, might be credited with the asset subtraction instead of Buildings, as explained in a preceding chapter, if for any reason it is desired to maintain original or cost figures in the Buildings account. In this case Buildings would be closed simply by balancing, and would show September 1st, as before, a balance of \$70,000. Allowance for Depreciation (or Allowance for Depreciation of Buildings) would show at this time a credit balance of \$350. The two accounts, taken together, give the net value of the asset, buildings. The point should be emphasized again that the charge to an expense account is the same in either case — whether Buildings or a subsidiary valuation account be credited. The expense account that is used must in its turn be closed. The closing of such accounts will be explained in a later section of the chapter

Occasionally the estimated value of a fixed asset at the end of an accounting period just equals the book value — that is, the value appearing in the asset account (assuming there is no valuation account) at the time the new inventory is taken. In the case of the Real Estate account given in the above trial balance of the A. B. Co. for example, the book value or debit balance is \$40,000. Assuming that an appraisal of the real estate shows its value to remain unchanged at \$40,000, it is evident that neither expense nor revenue is involved in the operating period just past as far as this asset is concerned. The Real Estate account would, therefore, be closed simply by balancing, no journal entries being required, thus :

## REAL ESTATE

1918				1918			
Aug. 1		J3	40,000	Aug. 31	Inventory	✓	40,000
			40,000				40,000
Sept. 1	Inventory	✓	40,000				

The only advantage of an actual closing of the account in this case is that it shows that a new inventory has been taken and that the estimated value of this asset on September 1st is the same as the book value August 1st. The bookkeeper's habit of leaving accounts with a single entry unchanged as regards dates for several periods should be avoided. Accounts such as Cash, from which neither expense nor revenue is ordinarily computed, are similarly closed by simply adding both sides and striking a balance.

All accounts which represent the more permanent property items are closed as shown in the above cases. From the nature of the fixed assets it follows that normally the variation in value for a single period will be slight relative to the total amount appearing in the asset account. Usually, however, some change occurs; and if the policy of keeping the accounts "up to date" is observed, these variations will be recognized at the end of each period.

## MATERIALS, SALES AND SUBSIDIARY ACCOUNTS

In the typical manufacturing enterprise the cost of the materials used in production during a given period constitutes a major item of expense; the amount of the sales of finished goods represents the principal revenue. Similarly, in the case of a retail or other trading company, the amount of merchandise sales for the accounting period is the most important gross income, and the cost of merchandise used is a large (usually the largest) deduction. The computation of these amounts in any case, and the closing of the various accounts involved, is an important, and somewhat difficult, part of the bookkeeper's work. In this section the process of closing Materials, Sales and subsidiary accounts will be discussed.

For an illustration it will be convenient to refer again to the trial balance given on a preceding page. This trial balance, as already explained, is supposed to represent the condition of the general ledger of the A. B. Co. on August 31st. Further, it will be assumed as before that this company has been in operation for a single month. This accounts for the fact that although the accounts Materials and Sales appear in the trial balance there are no subsidiary accounts such as Goods in Process or Finished Goods in this statement. The Materials account at this time shows a debit balance of \$120,600. Since total debits and total credits are shown in this trial balance it is evident that no credits have been entered in this account during August. This balance, therefore, represents the value of raw materials on hand at the beginning of the month plus the amount of any purchases (or other additions) made during the period. This means that no record has been kept in the accounts of materials which have passed on in the process of production. All purchases have been charged to the Materials account as made, and all sales of finished goods have been credited to Sales. But the accounts do not show the value of finished goods on hand or of goods in process, or the amount of raw materials still in the store-room. In order to close these accounts, therefore, and bring the books up to date, it will be necessary first to take inventories to determine these facts.

An inventory on August 31st, it will be assumed, discloses the

following data: (1) the value of all materials now in the store-room is \$40,000; (2) goods in the shop in various stages of manufacture are valued at \$8,000; and (3) finished goods in the warehouse are estimated at \$12,000. It will now be necessary to open several new accounts. A Goods in Process account should be charged with the value of semi-manufactured goods. An account, Finished Goods, should be debited with the value of the completed product on hand. It will also be convenient to open a special summary account, Trading, which may be used to show all adjustments of the sales total and the cost of materials.

The following exhibits show all of these accounts, including Materials and Sales, as they would appear when closed.

MATERIALS<sup>1</sup>

1918 Aug. 1		J4	80,000	1918 Aug. 31	To Trading	J96	80,600
31		P.B.6	40,600		Inventory	✓	40,000
			<u>120,600</u>				<u>120,600</u>
Sept. 1	Inventory	✓	40,000				

## GOODS IN PROCESS

1918 Aug. 31	To Trading	J96	8,000	1918 Aug. 31	Inventory	✓	8,000
			<u>8,000</u>				<u>8,000</u>
Sept. 1	Inventory	✓	8,000				

<sup>1</sup> When the accounts are closed by means of journal entries no explanation in the ledger is necessary other than a reference to the journal page on which the details of the transaction may be found. In each of the illustrations given in this section, however, the name of the account which is concurrently charged or credited as the case may be is shown opposite the closing entry. In some cases ledger accounts are closed without actual journal entries. That is, the closing amounts are transferred directly from account to account by the bookkeeper, and no entries are made in the journal. This procedure is not desirable, however. Closing transactions are actual happenings in the accounting sense, and are usually of particular impor-

## PRINCIPLES OF ACCOUNTING

## FINISHED GOODS

1918 Aug. 31	To Trading	J96	12,000	1918 Aug. 31	Inventory	✓	12,000
			<u>12,000</u>				<u>12,000</u>
Sept. 1	Inventory	✓	12,000				

## SALES

1918 Aug. 31	To Trading	J96	76,400	1918 Aug. 31		S.B. 8	76,400
			<u>76,400</u>				<u>76,400</u>

## TRADING

1918 Aug. 31	From Materials	J96	80,600	1918 Aug. 31	From Goods in Process	J96	8,000
	To Expense and Revenue	J96	15,800		From Finished Goods	J96	12,000
					From Sales	J96	76,400
			<u>96,400</u>				<u>96,400</u>

The closing journal entries, evidently, would be as follows:

(1)

Trading . . . . .	\$80,600	
Materials . . . . .		\$80,600

(2)

Goods in Process . . . . .	\$8,000	
Trading . . . . .		\$8,000

tance. The details of these transactions should be given in the general journal. Probably the best procedure for the bookkeeper is the following: (1) make the closing computations on loose sheets; then (2) make the proper entries in the journal; (3) post to the accounts affected; and finally (4) balance the accounts by making use of the inventory amounts.

(3)		
Finished Goods . . . . .	\$12,000	
Trading . . . . .		\$12,000

(4)		
Sales . . . . .	\$76,400	
Trading . . . . .		\$76,400

(5)		
Trading . . . . .	\$15,800	
Expense and Revenue . . . . .		\$15,800

It is important that the significance of these entries be clearly recognized. The entries under (1) show the total subtraction from materials made during the month and carry this subtraction to Trading as a deduction from revenue. But not all of these materials have been consumed in the manufacture of goods sold during this period. Finished goods in the warehouse amount to \$12,000, and goods in process are valued at \$8,000. If, then, the value of all materials taken from the storeroom is considered as a deduction from revenue it is necessary to offset this deduction with the goods in process and finished goods amounts. One method of making such adjustments is shown in the entries under (2) and (3) above. The credits to Trading in these cases represent not revenues but offsets to overstated costs. The concurrent charges to Goods in Process and Finished Goods recognize the asset balances in these accounts.

The gross revenue shown by the Sales account is transferred to Trading by the entries under (4). The balance of Trading, \$15,800, is now carried to Expense and Revenue. This latter account is a summary computation account — often called Profit and Loss — to which is carried the net balance of the materials and merchandise accounts and *all other* expense and revenue balances. (The nature and use of such an account will be further explained in a later section.) It is evident that the balance of the Trading account is not net revenue, but simply sales less certain important elements of total cost or expense.

The entries and accounts shown in the above case illustrate the general characteristics of the process of combining gross revenues and material costs at the end of the accounting period. Many variations in this procedure, however, are possible. The

total subtraction from materials, for example, might be first charged to Goods in Process rather than to Trading. After making the inventory adjustment the balance of the Goods in Process account could be closed into Finished Goods. The balance of this latter account, in turn, might then be transferred to Trading. If the results of a daily inventory of materials were recorded in the accounts this procedure would be particularly desirable. Another variation would involve the elimination of the Trading account. In this event Materials, Goods in Process, Finished Goods and Sales might be closed directly into an Expense and Revenue account.

The adjustments of gross revenue and cost of materials in the typical case are usually more numerous than as shown by the above entries. An account is often kept, for example, to show the amount of defective or otherwise unsatisfactory materials returned. The nature of such an account can be shown by a definite illustration. A certain company buys materials on account amounting to \$1,000. The entries (in the general ledger accounts) would be:

Materials . . . . .	\$1,000	
Accounts Payable . . . . .		\$1,000

Of this shipment materials amounting to \$200 are found to be of another type than that ordered, and are accordingly returned as unsatisfactory. The selling company allows the buying company credit on its books for the full amount of materials returned. The entries on the buying company's books would therefore be:

Accounts Payable. . . . .	\$200	
Materials Returned. . . . .		\$200

The balance of the Materials Returned account at the end of the period (\$500, it will be assumed) may be closed into Materials by the following entries:

Materials Returned . . . . .	\$500	
Materials . . . . .		\$500

Or the balance of this account might be carried directly to Trading.

Similarly, returns of finished goods by customers require an adjustment of the gross revenue figure either by closing the amount of such returns into the Sales account or by carrying this amount directly to Trading. The following entries illustrate a possible case:

(1)			
Sales Returns . . . . .		\$400	
Accounts Receivable . . . . .			\$400
(2)			
Sales . . . . .		\$400	
Sales Returns . . . . .			\$400

Rebates and allowances and other offsets and discounts require similar adjustments. All such amounts are current valuation items, and the accounts with these items must therefore be closed at the end of each period. Some further attention will be given to this matter in a later section of this chapter.

Thus far in discussing the inventories of goods in process and finished goods it has been implied that such amounts are of particular importance because of their influence on the cost-of-materials figure for a given period. This is a proper implication, but except in cases where the element of manufacture is entirely absent or negligible it is not the whole story. It should be recognized that such adjustments also prevent the over- or understatement of *other* expenses for the period. All charges for commodities and services expired are in part applicable to goods in process and finished goods on hand. In other words a part of the total of all asset expirations for a particular period is represented in the value of goods in process and finished goods. In some cases the element of manufacture may be more significant than the element of raw materials, for such items as labor services consumed, fuel burned, the depreciation of factory building, etc., may contribute more to the value of finished goods than the cost of the materials utilized in their production.

It is evident in the above case of the A. B. Co., for example, that if all asset expirations are treated as deductions from August revenues, other expenses than materials will be overstated; for all of these costs are not applicable to goods sold during the month.



This is the more apparent since this is the first month the company has operated. If manufacturing and selling were to proceed at exactly the same rate month by month hereafter, payments for labor services and all similar charges could be considered as deductions from revenue when made; that is, the expense amounts would be correctly stated although the incidence of specific items would be illogical. But unless this unusual condition exists it will be necessary to take into consideration each month the inventories of semi-finished and finished product in order to determine the expense and revenue totals properly applicable to each period. At the end of the next period it will not be the *total* inventories of goods in process and finished goods which the company's bookkeeper must carry to Trading or to Expense and Revenue as an offset to overstated expense charges, but rather the *increase* in these inventories over the amounts determined on August 31st. If these inventories show a *decrease* on September 30th it will be necessary, analogously, to consider the amount of the decrease an addition to expense; for otherwise September's costs will be understated.

In determining the value of goods in process or of finished goods, therefore, the problems of cost accounting are involved. The total cost of production — exclusive of selling expenses — must be apportioned among the various stages of manufacture and spread over units of finished and semi-finished goods. A physical inventory gives the number of units; an analysis of costs gives the value per unit. The difficult part of the process, evidently, is the allocation of costs. An account, Cost of Goods Sold, is often set up, and is charged with that part of total expense applicable to goods sold during the period. The balance of total cost incurred represents the value of materials, goods in process, and completed product on hand. Many subsidiary accounts and cost records are used in the typical case. No attempt will be made here to discuss the intricacies of factory cost accounting. This brief statement, however, should serve to suggest the nature of the problem, and its accounting significance.

Even in the case of a trading enterprise, where the element of manufacture is entirely absent, there are certain costs which may be incurred in a particular period — in addition to the principal merchandise cost — which are not entirely applicable to product

sold during that period. Freight and cartage, and the cost of unpacking, shelving, and otherwise preparing goods for sale are examples of such items. In taking inventories of merchandise on hand it is necessary to take such charges into consideration if the exact amounts of expense and revenue applicable to each period are to appear in the accounts of that period. If purchases and sales run fairly even month by month, however, these items can be charged to expense as they arise without serious error. In discussing the process of taking inventories of current assets in a later chapter some further attention will be given to this topic.

#### CLOSING MERCHANDISE ACCOUNTS

In the case of retail and other trading companies the merchandise accounts present certain special problems of analysis at the end of the accounting period which should be discussed at this point. As explained in a preceding chapter Merchandise is sometimes kept as a mixed account — that is, an account which presents the complication of combining specifically both asset and equity elements. This case will first be considered.

The Merchandise account in the trial balance of the Y. Co. December 31st, it will be assumed, shows total debits of \$122,600 and total credits of \$56,400. The first total represents the cost of all merchandise purchased during the period just ended plus the cost of goods on hand at the beginning of the period; the credit total shows the total value of goods sold during the period at selling prices. An inventory at this time shows goods on hand to the amount of \$78,600 valued at cost. Then \$122,600 less \$78,600 gives \$44,000, the *merchandise cost* of the goods sold. Subtracting this figure from \$56,400 gives a difference of \$12,400, the *merchandise revenue*, or “gross trading profit” as it is sometimes called, for the period.<sup>1</sup> In closing the Merchandise account the bookkeeper shows this computation thus :

<sup>1</sup> It should be noted that the term *revenue* can be applied with equal propriety to total sales, or to sales less merchandise costs. There is no fundamental reason for considering revenue in any case to be a balance remaining after a part but not all of the total expense of production has been deducted.

## MERCHANDISE

1917 Dec. 1	Inventory	✓	82,000	1917 Dec. 31	Inventory	S.B.3	56,400
31		P.B.5	40,600			✓	78,600
		J55	12,400				
			<u>135,000</u>				<u>135,000</u>
1918 Jan. 1	Inventory	✓	78,600	1918			

This method of closing illustrates again the bookkeeping practice of adding to the opposite side instead of subtracting. The inventory brought down at the left cancels the balancing entry on the credit side and shows the property balance on hand.<sup>1</sup> On January 1st the Merchandise account represents \$78,600 in property and nothing else. It is convenient to think of this closing computation in the case of Merchandise or any similar account in the way stated above: total debits less the new inventory shows the cost of goods sold; total credits less the cost of goods sold gives merchandise revenue. The bookkeeper, however, instead of using two instances of subtraction adds to the opposite sides and accomplishes the same result.

If a special Merchandise Revenue account were now set up to show this item of revenue the entries transferring the item from Merchandise to Merchandise Revenue would be:

Merchandise . . . . .	\$12,400	
Merchandise Revenue . . . . .		\$12,400

When this revenue is carried to a general Expense and Revenue account the following entries would be made:

Merchandise Revenue . . . . .	\$12,400	
Expense and Revenue . . . . .		\$12,400

<sup>1</sup> Thinking of the Merchandise account on December 31st as an expense and revenue account there is another way of viewing this closing computation. Since the total of the old inventory plus purchases is treated as a deduction from sales it is necessary to consider the new inventory as a revenue item — an addition to sales.

If no special Merchandise Revenue account had been kept, the item of revenue would have been carried directly from Merchandise to Expense and Revenue, thus :

Merchandise . . . . .	\$12,400	
Expense and Revenue . . . . .		\$12,400

The debits to Merchandise in both of these cases represent not an addition to the left-hand side, but a subtraction of the revenue or equity element from the right-hand side ; that is, such entries represent the transfer of an item of revenue from one account to another.

The use of such a mixed account for small enterprises is entirely proper ; but the nature of each of the different phases of merchandise should be clearly recognized. In the retail trade, merchandise as purchased is the raw material ; merchandise in the hands of the consumer constitutes the finished product. The element of manufacture is entirely absent and production consists primarily in furnishing place and time utilities. This situation, however, should not be allowed to obscure the fact that production is actually taking place, and that merchandise purchased and merchandise sold belong to entirely distinct classes of accounting data. The sales total represents gross revenue ; the cost of goods sold constitutes the principal expense ; merchandise on hand is often the most important asset. A merchandise account such as the one above, therefore, shows asset, expense, and revenue items. If these items are listed in the proper columns, however, and are correctly interpreted, no confusion results from the use of such a "combination" account.

In the case of a large retail enterprise it is desirable to use several accounts instead of one general account — as in the case just explained — to show the various phases of merchandise involved. A convenient procedure is the use of four distinct accounts for this purpose : (1) Merchandise Inventory ; (2) Merchandise Purchases ; (3) Merchandise Sales (Revenue) ; and (4) Merchandise Cost (Expense). At the time the trial balance is taken — using the figures in the above case — (1) would show a debit balance of \$82,000 ; (2), a debit balance of \$40,600 ; (3), a credit balance of \$56,400 ; and (4) would show no entries. The

inventory is as before \$78,600. What are the entries necessary to close these accounts?

Merchandise Inventory shows a debit balance of \$82,000, and the present inventory is but \$78,600. The procedure in closing this account would be similar to the case of Buildings described in a preceding section. Merchandise as an asset has declined in value \$3,400. Of the \$82,000 listed in this account, \$3,400 has expired. This transaction would be journalized as follows:

Merchandise Cost . . . . .	\$3,400	
Merchandise Inventory . . . . .		\$3,400

If the new inventory had been larger than the old, a debit to Merchandise Inventory and a credit to Merchandise Cost for the amount of the increase would be necessary.

Merchandise Purchases shows a debit balance of \$40,600. This account is not treated as an asset account in this case but as an expense account, the asset adjustment, if more or less goods than the amount purchased are sold, being made through Merchandise Inventory as shown above. The amount in this account will then be closed into Merchandise Cost, thus:

Merchandise Cost . . . . .	\$40,600	
Merchandise Purchases . . . . .		\$40,600

Merchandise Cost and Merchandise Sales can now be closed into Expense and Revenue by the following entries:

Expense and Revenue . . . . .	\$44,000	
Merchandise Cost . . . . .		\$44,000

and,

Merchandise Sales . . . . .	\$56,400	
Expense and Revenue . . . . .		\$56,400

The merchandise accounts, closed, would now appear as follows:

#### MERCHANDISE INVENTORY

1917				1917			
Dec. 1	Inventory	✓	82,000	Dec. 31	Inventory	J55	3,400
						✓	78,600
			82,000				82,000
1918							
Jan. 1	Inventory	✓	78,600				

MERCHANDISE PURCHASES<sup>1</sup>

1917 Dec. 31		P.B.5	40,600	1917 Dec. 31		J55	40,600
			40,600				40,600

## MERCHANDISE SALES

1917 Dec. 31		J55	56,400	1917 Dec. 31		S.B.3	56,400
			56,400				56,400

## MERCHANDISE COST

1917 Dec. 31		J55	3,400	1917 Dec. 31		J55	44,000
		J55	40,600				
			44,000				44,000

The Expense and Revenue account would now show the following condition as far as merchandise items are concerned :

## EXPENSE AND REVENUE

1917 Dec. 31		J55	44,000	1917 Dec. 31		J55	56,400
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The procedure just outlined is a convenient and logical method of handling the merchandise accounts. In this case merchandise

<sup>1</sup> The debit balance shown in this account is intended to represent the total of all postings made during the month ; and this is true of all the trial balance figures used in these illustrations.

cost is carried to the debit side of the Expense and Revenue account; and gross revenue from sales, before any deductions have been made, is carried to the credit side. As was shown above, however, it is perfectly possible to make all these computations in one account, and to carry merchandise revenue less merchandise cost from this single account directly to Expense and Revenue. The chief reason for using several accounts is the need for differentiating sharply between departments and phases of the business for managerial purposes. Further, where special journals are used this procedure connects the ledger accounts more definitely with the books of original entry.

An alternative procedure is the use of all the accounts shown above with the exception that a computation account, Merchandise Trading, is used instead of Merchandise Cost. This account is similar to the Trading account discussed in the preceding section, and is of advantage particularly in cases where it is desired to secure an intermediate revenue figure before net expenses have been deducted. Using a Merchandise Trading account for the above case the closing entries would be as follows :

(1)		
Merchandise Trading . . . . .	\$3,400	
Merchandise Inventory . . . . .		\$3,400

which adjusts Merchandise Inventory; and,

(2)		
Merchandise Trading . . . . .	\$40,600	
Merchandise Purchases . . . . .		\$40,600
Merchandise Sales . . . . .	\$56,400	
Merchandise Trading . . . . .		\$56,400

which close purchases and sales into Merchandise Trading; and,

(3)		
Merchandise Trading . . . . .	\$12,400	
Expense and Revenue . . . . .		\$12,400

which carries the item of revenue less merchandise cost into Expense and Revenue.

The Merchandise Trading account, closed, would now stand as follows :

## MERCHANDISE TRADING

1917				1917			
Dec. 31		J55	3,400	Dec. 31		J55	56,400
		J55	40,600				
		J55	12,400				
			<u>56,400</u>				<u>56,400</u>

A Merchandise Trading account is especially useful if it be desired to further adjust the merchandise revenue item before it is carried to a general Expense and Revenue account. Discounts on purchases and sales, as explained in a preceding chapter, are valuation items which must be used to adjust merchandise cost and merchandise revenue, before the exact amount of revenue is ascertained. One method of making this adjustment is to close the balances in the Purchase Discounts and Sales Discounts accounts into Merchandise Trading. Using the amounts appearing in the trial balance on page 152 for an illustration, the entries would be:

Merchandise Trading . . . . . \$2,100  
 Sales Discounts . . . . . \$2,100

and,

Purchase Discounts . . . . . \$1,900  
 Merchandise Trading . . . . . \$1,900

Similarly, other allowances and rebates as well as purchase and sales returns may be set up in special accounts which are closed into Merchandise Trading at the end of each period. The process of closing such accounts is similar to the procedure shown in the preceding section in connection with materials and finished goods returned.

It is sometimes urged that other expenses, such as "in-freight," are costs of merchandise, and as such should either be closed into Merchandise Purchases or Merchandise Trading. This procedure is not unreasonable, particularly where merchandise is the most significant cost and product. But arguments nearly as valid can be made in favor of closing *all* expense items in such cases into some merchandise account. And if this were done the



account in question would simply become a general Expense and Revenue account. It is doubtful if the dictates of logical analysis are further satisfied by such adjustments. Further, in most cases no new information of sufficient importance is furnished to warrant the expenditure of the necessary clerical effort. As suggested in the preceding section, however, the amount of such costs as in-freight applicable to goods on hand at the end of a period should be considered in determining the inventory figure.

In the case of a manufacturing enterprise, evidently, the Materials account may be divided into two accounts, Materials Inventory and Materials Purchases. Such accounts are closed in the same way as the corresponding merchandise accounts shown above. Where a firm deals in several types of merchandise, or requires several kinds of raw materials, a whole series of these accounts may be used. Similarly a distinct sales account may be opened for each important type of product. The process of closing the accounts in such cases is more complex than in the cases here discussed, but it would be accomplished in an analogous manner.

In discussing merchandise inventories and merchandise expense and revenue items in this section it has been assumed for convenience that no change in cost prices has occurred during the period in question, and that no value declines because of physical deterioration or obsolescence have taken place. If the inventory item used had involved such changes, however, the closing entries would have been made in exactly the same manner as shown above.

#### CLOSING ACCOUNTS RECEIVABLE

Accounts representing depreciable rights against other individuals and firms are often closed simply by balancing, as are the equipment property accounts, and the expirations are recorded in subsidiary valuation accounts. Accounts Receivable furnishes an important illustration of this procedure.

In the illustrative trial balance appearing on page 152 this account shows total debits of \$24,800 and total credits of \$13,800. The debit total represents the sum of the additions to this kind of property made during August plus the balance at the begin-

ning of the period. (If it be assumed, as before, that the A. B. Co. has been operating for a single month it is probable that Accounts Receivable had no balance on August 1st.) The credit total shows the amount of such claims paid during the month. These figures represent the totals of the daily or weekly postings to Accounts Receivable from the sales book, cash book, or other journal. At the end of the month this account would be closed by taking a balance, and would then appear as follows :

## ACCOUNTS RECEIVABLE

1918 Aug. 31		S.B.8	24,800	1918 Aug. 31		C.B.4 J97 ✓	10,200 3,600 11,000
					Balance		
			24,800				24,800
Sept. 1	Balance	✓	11,000				

The balance of this account, however, is not likely to represent the actual value of the outstanding book accounts. In the case of nearly every business enterprise the customers' accounts which prove to be entirely worthless or are not paid in full amount to a more or less considerable fraction of the total of such accounts arising during a given season or year. A reasonable allowance, therefore, should be made at the end of each accounting period for the amount of "bad debts" applicable to the business of that period. If such a deduction from revenue is not recorded in each case the accounts will not show a net revenue figure based upon the recognition of all actual accruals of cost and income within the period. For an illustration of the treatment of an allowance for bad accounts it will be assumed that of the balance (\$11,000) shown in the above case three per cent, or \$330, is a reasonable estimate of the amount which will prove uncollectible. How should this item be recorded in the accounts?

Since Accounts Receivable is a controlling account for the customers' ledger no deductions for estimated bad debts should be shown directly in this account. Otherwise the totals of the debit and credit balances of the individual accounts in the subsidiary ledger will not equal the debit and credit totals in Ac-

counts Receivable. The controlling account, therefore, should be closed by balancing as shown above. It will then be necessary to open a valuation account, Allowance for Uncollectible Accounts, in which to record the offset, or valuation item, of \$330. The journal entries would be as follows:

Expense and Revenue . . . . .	\$330	
Allowance for Uncollectible Accounts . . . . .		\$330

(A special account, Uncollectible Accounts Expense, might be charged with the amount of this deduction. In this case it would be necessary finally to close the subsidiary expense account into Expense and Revenue.)

The charge to Expense and Revenue deducts the proper amount from the revenue of the period, and the credit to the valuation account indicates the decline in assets. The balance of Accounts Receivable less the balance now appearing in the subsidiary account shows the estimated value of the outstanding book accounts.

The later entries affecting Allowance for Uncollectible Accounts throw some light upon the nature and use of such a valuation account. On August 31st, it may be assumed, A. Wilson owes the A. B. Co. \$200 on open account. A few weeks later this customer becomes bankrupt and when his estate is liquidated the unsecured creditors receive but ten cents on the dollar in settlement of their claims. The entries on the books of the A. B. Co. at this time would be:

Cash . . . . .	\$ 20	
Allowance for Uncollectible Accounts . . . . .	180	
Accounts Receivable . . . . .		\$200
(A. Wilson)		

These entries recognize the retirement of a specific account and hence both the controlling account in the general ledger and the customer's personal account in the subsidiary ledger should be credited. The difference between the amount realized and the face of A. Wilson's account is the amount of the charge to Allowance for Uncollectible Accounts. This amount has been previously charged against revenue, and the subtraction from the asset has been indicated by a credit to the valuation account.

Since a specific asset is now being written off, a credit directly to the asset account should be substituted for a credit item in the subsidiary account.

At the end of an accounting period it may be necessary to recognize changes in the values of other rights as well as accounts receivable. In the trial balance of the A. B. Co. Notes Receivable shows a net debit balance of \$2,900. If there is good reason for thinking that the notes now held by the company are worth less than this sum this fact should be recognized in the accounts. The amount of the estimated loss applicable to the current period should be charged against the revenue of the period. The subtraction from assets may be indicated by a credit to a valuation account as in the above case. When, later, a specific note is discovered to be worthless, Notes Receivable would be credited and the valuation account debited for the amount of the note. In this case it will be assumed that the inventory figure is the same as the balance of the Notes Receivable account.

The account, Securities Owned, appearing in the same trial balance, represents still other rights which are subject to value changes. Assets such as securities often fluctuate in market price. The desirability of recognizing such changes in the accounts is a matter of some dispute. It has been pointed out several times in the preceding pages that if it is the function of the accounts to present as nearly as possible the actual situation all value changes should be recorded. In so far as the ownership of securities, however, arises outside of the regular business of an enterprise, variations in the values of such assets can hardly be considered as affecting either gross revenue or expense totals. The entries given under cases (2) and (4) on page 114 suggest a more proper treatment for such value changes. In the illustrative case of the A. B. Co. it will be assumed that the balance of the Securities Owned account, \$4,000, is also the inventory figure. This account would then be closed by balancing and no closing journal entries would be required.

#### CLOSING OTHER CURRENT ACCOUNTS

In addition to the cases already discussed there are many other common accounts with current commodities and services that involve expense (or revenue) items, and hence furnish prob-

lems of interpretation at the end of the accounting period. In the illustrative trial balance of the A. B. Co., given at the beginning of this chapter, are shown Labor, Fuel, Insurance, Miscellaneous Supplies and Services, and Rent as examples of such accounts. These accounts will be briefly discussed in the order mentioned.

Labor shows a debit balance of \$8,540. This represents the usual situation; the business enterprise buys labor services but seldom has such services for sale. An examination of the payroll on August 31st, it will be assumed, shows that not only have all the services represented by this debit total been received and consumed, but that services to the amount of \$630 have been consumed for which payment has not yet been made. That is, \$8,540 plus \$630, or \$9,170, represents the total value of labor power which has been utilized during the past accounting period, or, in other words, the total labor *expense*. It is this amount, and not the cash outlay, which should be charged against the revenue of the past month. (The amount of labor cost applicable to goods in process and finished goods on hand is assumed to be included in the inventory figures for these assets; and gross revenue is adjusted to allow for this and similar items as explained in a preceding section.) The closing entries would be:

Labor Expense . . . . .	\$9,170	
Labor . . . . .		\$9,170

If no special Labor Expense account were used the entries would be:

Expense and Revenue . . . . .	\$9,170	
Labor . . . . .		\$9,170

The Labor account, closed, would now appear as follows:

LABOR

1918 Aug. 31		C.B. 5 √	8,540 630	1918 Aug. 31		J97	9,170
	Inventory						
			<u>9,170</u>				<u>9,170</u>
				Sept. 1	Inventory	√	<u>630</u>

The inventory item on the debit side of this account represents the amount which must be added to the trial balance figure to give the total labor expense for the period as explained above. The inventory balance in this case represents not an asset but an equity-item. The amount of \$630 is due certain laborers, and the Labor account is used for convenience to show their equities. It is important that the effect of this accrued liability on the entries of the next period be noted. The item of \$630 will, of course, be paid shortly. At that time Cash will be credited and Labor debited. Entering this amount, therefore, as an equity (a credit) at the end of this period prevents an overstatement of the labor services consumed in the succeeding period and shows as well the exact status of the enterprise in this respect at the present moment.

The Fuel account in this case shows a debit balance of \$600. On August 31st, it will be assumed, coal in the bins amounts to \$200. The closing entries, evidently, would be as follows:

Fuel Expense . . . . .	\$400	
Fuel . . . . .		\$400

If no special expense account were opened the entries would be:

Expense and Revenue . . . . .	\$400	
Fuel . . . . .		\$400

The Fuel account, closed, would now appear as follows:

## FUEL

1918				1918			
Aug. 31		C.B.5	600	Aug. 31	Inventory	J97 ✓	400 200
			<u>600</u>				<u>600</u>
Sept. 1	Inventory	✓	200				

The accounts Insurance, and Miscellaneous Supplies and Services, would be closed in a similar manner. The latter account includes such items as postage, stationery, transportation services, etc. It corresponds to the more familiar "General Expense." Such accounts would normally show asset inventories.

In this case it will be assumed that insurance prepaid on August 31st amounts to \$125, and that stationery and other supplies on hand are valued at \$100. The journal entries closing these accounts would then be as follows:

(1)			
Expense and Revenue	.	.	\$125
Insurance	.	.	\$125
(2)			
Expense and Revenue	.	.	\$700
Miscellaneous Supplies and Services	.	.	\$700

The accounts would be balanced and the inventories brought down as in the case of the Fuel account shown above.

The Rent account in this case shows a credit total of \$300. This amount, it will be assumed, represents a payment to the A. B. Co. for the use of one floor of its building. This floor is leased by the S. Co. for \$1,200 per year, payable quarterly in advance. On August 1st the first quarterly payment was made. It is evident that at the end of the month the A. B. Co. can consider but one-third of this sum as revenue applicable to the current period, since the company is still obligated to furnish a valuable service during the months of September and October. In other words, \$200 of the balance now appearing in the Rent account represents not revenue but a current liability — a liability which will be retired by the furnishing of a continuous service during the next two months rather than by a lump payment with cash or an equivalent. The journal entries necessary to close this account would be as follows:

Rent	.	.	\$100
Expense and Revenue	.	.	\$100

The Rent account, closed, would stand as follows:

RENT							
1918 Aug. 31		J97	100	1918 Aug. 31		C.B.4	300
	Inventory	✓	200				
			<u>300</u>				<u>300</u>
				Sept. 1	Inventory	✓	200

In many cases rent is paid after the service involved is furnished instead of being prepaid, as in the above illustration. Both asset and liability inventories are possible in connection with such a case. Accruals of rent in favor of the lessor represent an asset — a right against the lessee of the nature of an account receivable. Such accruals also constitute a part of the rent revenue for the past period, although this portion of the earnings has not yet been realized in cash. On the books of the lessee rent accruals represent a liability — a claim against the lessee for service rendered of the nature of an account payable. Further, such an accrual should be considered a part of the lessee's operating expenses for the past period, since it represents the value of a service used in production during the period although the payment for the service has not yet been made.

In addition to the accounts which represent the purchase and sale of current commodities and services accounts with current valuation items appear in nearly every trial balance. Examples of current valuation items are cash discounts on sales and purchases, rebates, and other allowances. Such offsets can be closed into the merchandise accounts, as has been explained, or they may be carried directly to Expense and Revenue. In the trial balance of the A. B. Co. there are two such accounts, Sales Discounts and Purchase Discounts. The entries closing the balances of these accounts into Expense and Revenue would be as follows :

(1)		
Expense and Revenue . . . . .	\$2,100	
Sales Discounts . . . . .		\$2,100

(2)		
Purchase Discounts . . . . .	\$1,900	
Expense and Revenue . . . . .		\$1,900

Although the total amount appearing in the Sales Discount account is evidently a proper deduction from the gross revenue figure for the current period, it would seem to be not quite accurate to consider the total of all purchase discounts allowed during August as offsets to current costs; for a considerable part of the total of all purchases of materials made during the month is not applicable to August sales. It would appear, therefore,



that the amount of purchase discounts applicable to goods on hand should be credited to Materials rather than to Expense and Revenue. If, however, the inventories of materials, goods in process, and finished goods are based upon *net* prices for materials and supplies, the amount which is transferred from Trading to Expense and Revenue will involve the necessary adjustment.

#### SUMMARY ACCOUNTS FOR SUNDRY ASSETS AND LIABILITIES

The accounts in which are recorded the purchases of current commodities and services such as fuel and insurance can with reason be considered as either asset or expense accounts as was explained in Chapter III. The method of closing shown in the preceding section is consistent with the view that such accounts are asset accounts. If these accounts are viewed as expense accounts, however, another method of closing would seem more logical. This alternative procedure (which is frequently used in practice) will be briefly explained.

Since an expense account cannot well show an inventory balance, the figure in any case which represents the amount of a current asset which has not expired during the current period should be transferred at the end of the period to a special asset account. An account called "Sundry Assets," or by a similar name, may be opened for this purpose. In the case of the Fuel account shown in the last section, for example, the inventory figure which represents the value of coal on hand on August 31st should be closed into Sundry Assets. The journal entries closing the Fuel account if this procedure were adopted would be as follows:

(1)		
Sundry Assets . . . . .	\$200	
Fuel . . . . .		\$200
(2)		
Expense and Revenue . . . . .	\$400	
Fuel . . . . .		\$400

The entries under (1) transfer the asset balance at the end of the month from Fuel, an expense account, to Sundry Assets. The entries under (2) shift the amount of fuel expense for the period

from Fuel to Expense and Revenue. The Fuel account would now show no balance.

The principal advantage to be derived from the use of such a special asset account arises in connection with the preparation of the balance sheet. Several small asset items may in this way be transferred to a summary account and appear in the balance sheet in total, rather than under several heads. Thus the asset balances of the Insurance and Miscellaneous Supplies and Services accounts mentioned above may also be transferred to Sundry Assets. The importance of this convenience, however, may be easily exaggerated. It is quite possible to collect several account balances under one head for balance sheet purposes without opening a special ledger account and closing the various balances into this account. In other words, while a balance sheet may consist simply in an asset-equity arrangement of the account balances after the process of closing is completed, any complete statement of assets and equities based upon these balances — however the items be combined or arranged — may be said to constitute a balance sheet (see Chapter IX).

When a Sundry Assets account is used it is necessary to close this account and reopen the various expense accounts involved at the beginning of the following period. On September 1st, for example, it would be necessary to reopen the A. B. Co.'s Fuel account by the following entries:

Fuel . . . . .	\$200	
Sundry Assets . . . . .		\$200

These entries, evidently, are just the reverse of the above closing entries. The debit to Fuel can now be conceived as the first purchase of coal applicable to the operation of the business during September.

Similarly, an account, Sundry Liabilities, may be opened to serve as a summary account for the various small liability items which are discovered to be accrued at the end of an accounting period. In the case of the Labor account discussed in the preceding section, for example, the following entries would be necessary to close the account if this procedure were adopted:

(1)		
Labor . . . . .	\$630	
Sundry Liabilities . . . . .		\$630

(2)		
Expense and Revenue . . . . .	\$9,170	
Labor . . . . .		\$9,170

On September 1st the entries under (1) would be reversed, thus :

Sundry Liabilities . . . . .	\$630	
Labor . . . . .		\$630

It is obvious that after the reopening entries are made in any of these cases the account involved shows exactly the same status whether closed by bringing down the inventories directly — as shown in the last section — or by making use of special summary accounts for the inventory items. The second method is somewhat more cumbersome than the first, in that it involves the use of an additional account in each case and requires additional closing and opening entries. It is doubtful whether the advantages of this procedure outweigh the disadvantages.

#### CLOSING THE EXPENSE AND REVENUE ACCOUNTS

As has been indicated several times in the preceding pages the special expense (and revenue) accounts which are opened for statistical purposes at the end of the accounting period should finally be closed into a summary account, Expense and Revenue. The amounts appearing in such accounts as Depreciation Expense, Labor Expense, Fuel Expense, etc., as well as in such intermediate summary accounts as Trading, for example, are transferred to this summary account. The journal entries necessary to close the accounts mentioned (using the amounts given in the preceding illustrations) would be as follows :

(1)		
Expense and Revenue . . . . .	\$350	
Depreciation Expense . . . . .		\$350

(2)		
Expense and Revenue . . . . .	\$9,170	
Labor Expense . . . . .		\$9,170

(3)		
Expense and Revenue . . . . .	\$400	
Fuel Expense . . . . .		\$400

(4)		
Trading . . . . .	\$15,800	
Expense and Revenue . . . . .		\$15,800

In the trial balance of the A. B. Co. shown at the beginning of this chapter there were evidently no pure expense or revenue accounts; for — with the exception of the valuation accounts Purchase Discounts and Sales Discounts — an inventory has been assumed in each case discussed. It would be quite possible, however, for the amount of a commodity or service consumed in a particular case to coincide with the amount appearing in the trial balance. Freight and Cartage, and Repairs to Machinery are typical examples of expense accounts which are likely to show in the trial balance the actual deductions from revenue for the period. All such accounts are also closed by transferring the debit balance in each case to Expense and Revenue.

If it be assumed that in addition to the expenses already mentioned in the preceding pages there is an item of depreciation expense in connection with equipment of \$300, the Expense and Revenue account of the A. B. Co., when closed on August 31st, would appear as follows:

## EXPENSE AND REVENUE

1918			1918		
Aug. 31	J96	350	Aug. 31	J96	15,800
	J96	300		J97	100
	J96	330		J97	1,900
	J97	9,170			
	J97	400			
	J97	125			
	J97	700			
	J97	2,100			
	J98	4,325			
		<u>17,800</u>			<u>17,800</u>

The balance of Expense and Revenue is the net revenue (or net deficit) figure — the difference between the amount of all accruals of revenue for the current period and the total of all commodities and services which have expired in producing this

revenue. In the above case revenues exceed expenses by \$4,325. The last debit entry is not an expense charge but represents rather the withdrawal of the net revenue element from the summary account. The closing journal entries would be as follows :

Expense and Revenue . . . . .	\$4,325	
Net Revenue . . . . .		\$4,325

In accounting practice the Expense and Revenue account is often labeled "Profit and Loss" or "Loss and Gain." The particular terminology used in any case is not a matter of great importance provided the nature of the account is clearly understood. There is a tendency in practice, however, to combine both gross expense and revenue items and net revenue charges and credits in the Profit and Loss account. This practice should be avoided. The distinction between gross revenue and net revenue items is one of the most important distinctions in accounting. To confuse the Expense and Revenue and the Net Revenue accounts destroys, in a measure, the value of such accounts; and any such procedure is likely to lead to improper classification in the financial statements.

In the case of the typical large scale enterprise where an attempt is made to classify expenses not only in terms of the important types of commodities and services consumed but on a functional basis as well, the special expense accounts set up may be very numerous, and the task of opening and closing such a series of accounts will be correspondingly detailed. A number of intermediate summary accounts which are finally closed into Expense and Revenue are usually employed. Examples of such accounts are Buying Expense, Manufacturing Expense, Selling Expense, and General Expense. Similarly, revenue items may be classified in some detail in the accounts. The classifications given on pages 139-140, and on page 142, are illustrative. Care must be taken in such cases that each subsidiary account be closed into the proper intermediate account. Otherwise the conclusions drawn by the management from the data furnished by these special summary accounts will be misleading. In any case, however, the process of closing is accomplished in an analogous manner to the procedure outlined above.

## CLOSING THE NET REVENUE AND EQUITY ACCOUNTS

The last step in closing the accounts in any case is the distribution of net revenue (or the allocation of net deficit) to the various equities in the enterprise. In this connection the relation of the contractual equities to the enterprise will be first considered.

In the trial balance of the A. B. Co. shown on page 152, no Bond Interest account appears. This is due to the fact that there has been no actual disbursement to the bondholders during the month of August, and that there were no accruals in favor of the bondholders on August 1st. (It will be assumed, for convenience, that the bonds were issued on August 1st.) But since the bondholders have contractual claims upon net revenue — or upon capital if there is no net revenue — their equity in the enterprise accrues as a function of time, and consequently the actual increase in this equity during an accounting period seldom coincides with the amount paid.<sup>1</sup>

In this case it will be assumed that the outstanding bonds were issued at par, and that the interest rate is six per cent, payable semiannually. The accrued interest for the month of August, therefore, amounts to \$200. It is this amount which represents the interest of the bondholders in the net revenue of the accounting period just past. The entries opening the Bond Interest account, and appropriating \$200 from Net Revenue, would be as follows:

Net Revenue . . . . .	\$200	
Bond Interest . . . . .		\$200

Bond Interest, closed, would now appear as follows:

BOND INTEREST							
1918 Aug. 31	Inventory	✓	200	1918 Aug. 31		J98	200
			<u>200</u>				<u>200</u>
				Sept. 1	Inventory	✓	<u>200</u>

<sup>1</sup> Preferred stockholders' claims may also be said to accrue in time, but it is not customary to recognize these accruals in the accounts. Stockholders as well as

The Commercial Interest account in the illustrative trial balance shows a debit total of \$70 and a credit total of \$30. This account is used to show the payments made to the equities represented by notes payable, and items of net revenue received by the company from bank balances and from promissory notes held against other parties. The interpretation of this account presents some difficulty. The debit total represents payments actually made during the period plus interest due the firm at the beginning of the period if there were any such accrual. The credit total shows the amounts received by the company during the period for rendering the service of capital plus any interest accrued and unpaid at the beginning of the period. It will be assumed that an examination of the company's notes receivable and payable at this date shows that interest is accrued on notes receivable to the amount of \$20, and on notes payable, \$50. The Commercial Interest account, closed, would now appear as follows :

## COMMERCIAL INTEREST

1918				1918			
Aug. 1	Inventory	✓	15	Aug. 1	Inventory	✓	10
31	C.B.5		55	31	C.B.4		20
	Inventory	✓	50		Inventory	✓	20
					J98		70
			<u>120</u>				<u>120</u>
Sept. 1	Inventory	✓	20	Sept. 1	Inventory	✓	50

The closing entries, evidently, would be :

Net Revenue . . . . .	\$70	
Commercial Interest . . . . .		\$70

It is important that the various elements represented in such a complex account be carefully distinguished. (1) All interest payments made during the period are entered on the debit side. These items represent distributions of net revenue to certain contractual equities, in this case represented by notes payable. (2) All payments received by the firm for furnishing capital to outsiders are entered as credits. These credits are additions to

bondholders, however, have rights of legal procedure against the enterprise if their legitimate claims to a portion of net revenue are not being recognized.

*net* revenue, for they represent the sale of the services of the owners where no deductions are involved. (3) The interest inventory which shows the amount of interest accrued payable is entered as a credit. This element of the account then represents a simple equity or liability. (4) Interest accrued receivable is recorded as a debit inventory. (Each inventory is first entered on the opposite side for the purpose of making the closing computation.) This item represents an asset, a right against outside parties.<sup>1</sup> The balance of this complex account represents the net debit or credit to Net Revenue. (It is common practice to charge such a balance to expense. The legitimacy of this procedure will be discussed in the next chapter.)

It would be possible to use four accounts instead of one to show the different elements in the above case; and wherever the item of commercial interest is large it is no doubt best to adopt this or a similar procedure. The titles of such accounts could be: (1) Interest Paid; (2) Interest Received; (3) Interest Payable (equity); (4) Interest Receivable (asset).

It is evident that some enterprises could make use of a large number of interest accounts, not only to record the various phases of interest, but to show the relations of the different classes of contractual equities to the company as a whole.

Distributions to the proprietary equities, such as dividends on capital stock, are analogous to interest payments in their effect upon net revenue and the fundamental classes in the accounting equation. But usually these distributions are residual and not contractual in character. It will be assumed in the case of the A. B. Co. that the directors decide to post a dividend of one and one-half per cent on August 31st, the entire amount to be appropriated from net revenue. The entries covering this dividend declaration would be:

Net Revenue . . . . .	\$2,550	
Dividends . . . . .		\$2,550

When these dividends are finally paid the journal entries would be as follows:

<sup>1</sup> Discount arising when notes payable are discounted (sometimes called prepaid interest) should be carefully distinguished from an asset interest inventory if one does not wish to obscure the net revenue figure.



Dividends . . . . .	\$2,550	
Cash . . . . .		\$2,550

These entries, evidently, would balance the Dividends account. In a later chapter the treatment of dividend transactions will receive further consideration.

Transactions involving tax payments or accruals also affect the Net Revenue account, as already explained. Taxes are usually paid annually or semiannually; but if these items can be ascertained beforehand with a reasonable degree of certainty accruals should be taken into consideration. It will be assumed in the case of the A. B. Co. that the management decides to appropriate from the net revenue for August the amount of \$250 as a reserve to represent the accrual of state and federal taxes. The payments made at the end of the fiscal year may not be exactly on this basis, since the company's relation to the government is not contractual. This estimate, however, it will be assumed, is based upon all the information available. The entries recognizing this accrual would be :

Net Revenue . . . . .	\$250	
Reserve for Taxes . . . . .		\$250

At this moment, then, the equity of the government is recognized on the books to the extent of \$250.

As was emphasized in a preceding chapter, any actual loss that constitutes a *net* decrease in equities is a net revenue or surplus item, and not an expense. As long as such items are small this analysis is not of very great importance, but a significant loss, if treated as an expense, obscures the net revenue figure and in part destroys the value of the expense and revenue accounts for managerial purposes. Hence all actual losses should be debited to the Net Revenue or Surplus accounts rather than to Expense and Revenue. In this case it will be assumed that there have been no unusual occurrences giving rise to actual loss.

The Net Revenue account of the A. B. Co. on the basis of the entries that have been discussed would now appear as follows :

NET REVENUE <sup>1</sup>

1918 Aug. 31		J98	70	1918 Aug. 31		J98	4,325
		J98	200				
		J98	2,550				
		J98	250				
		J98	1,255				
			4,325				4,325

The last debit entry appearing in the above account represents the balance of net revenue which has not been specifically appropriated, and hence may be transferred to Surplus. The entries closing Net Revenue and opening the Surplus account would be:

Net Revenue . . . . .	\$1,255	
Surplus . . . . .		\$1,255

A considerable increase in the stockholders' equity, in addition to the amounts appropriated as dividends, interest and taxes, represents the result of the operation for the period. If operation had resulted in a net deficit, the stockholders' equity, at least, would have been decreased.

The Surplus account, balanced, would now appear as follows:

## SURPLUS

1918 Aug. 31	Balance	✓	1,255	1918 Aug. 31		J98	1,255
			1,255				1,255
					Balance	✓	1,255

The equity adjustments are all made in this case through the subsidiary equity accounts, Net Revenue, and Surplus. The accounts Capital Stock, Bonds, Notes Payable, and Accounts Payable are left unchanged as they appear in the trial balance shown at the beginning of the chapter.

<sup>1</sup> This account has been called the "Profit and Loss Allocation" account. See Gilman, *Principles of Accounting*, p. 213.

## IX

### THE PREPARATION OF STATEMENTS

AFTER the accounts of an enterprise have been properly adjusted by means of closing entries the balances appearing in the general ledger reveal again the exact current status of the enterprise (assuming the inventories to be correct); and the financial history of the concern for the past accounting period can be determined by a careful examination of the books of account and original entry. In other words, the ledger balances at this time disclose the present condition of all asset and equity items, and the process whereby this condition was immediately attained is represented — in summary form at least — by the trial balance figures and the closing adjustments. The task of reading this information directly from the accounts, however, is somewhat difficult, and hence an important part of the accountant's work consists in the preparation of statements or exhibits which present in compact well-arranged form the items necessary to an intelligible showing of the various important phases of the business process and its results. This sort of information is invaluable for the purposes of the operating management, the board of directors, the owners, and prospective creditors or investors. These interests wish to secure the accounting data of the enterprise involved in any case in summary and readable form since they have not the time, opportunity, or skill to glean the desired information directly from the accounts.

The three important financial statements are: (1) the *expense and revenue statement*; (2) the *net revenue and surplus statement*; <sup>1</sup>

<sup>1</sup> The surplus statement is sometimes considered to be a distinct exhibit. See Chapter XXV.

and (3) the *balance sheet*. These statements will be briefly discussed in the order named. Some special-column devices for computing and presenting these statements — of value chiefly to the student and the practicing accountant — will also be considered. In this chapter attention will be directed principally to the more general characteristics of financial statements and their relation to the underlying system of accounts in any case. A more elaborate discussion of accounting statements will be given in Part Five.

#### THE EXPENSE AND REVENUE STATEMENT

The expense and revenue statement in any case is a systematic presentation of all expenses and all revenues applicable to a given accounting period.<sup>1</sup> That is, such an exhibit shows all items of gross income which have accrued during the period, and the amounts which represent the commodities and services which have expired in producing this revenue; and its concluding figure is the net revenue or net deficit. It is this statement which presents the results of business operation, and hence reflects, in a measure, the efficiency of the operating officials. It is the net balance of this statement which shows whether the events of the past period have resulted in a favorable or unfavorable change in the status of the private equities involved.

If all items of expense and revenue are carried to a summary account as explained in the preceding chapter, that account itself is virtually an expense and revenue statement, except that the amounts are not itemized. In simple account form, therefore, the expense and revenue statement is an itemized replica of the Expense and Revenue account, showing all expenses in one column and all revenue items in another. The A. B. Co.'s expense and revenue statement for August, for example, as constructed from the Expense and Revenue account shown on page 185, would appear as follows :

<sup>1</sup> In accounting practice this statement, combined with the net revenue and surplus statement, is variously called the "income sheet," the "profit and loss statement," the "loss and gain statement," etc.

A. B. Co., AUGUST 31, 1918

## EXPENSE AND REVENUE STATEMENT

Depreciation of Buildings	\$ 350	Trading Revenue . . .	\$15,800
Depreciation of Equipment	300	Rent from Building . .	100
Allow. for Doubtful Accts.	330	Purchase Discounts . .	1,000
Labor Expense . . . .	9,170		
Fuel Consumed . . . .	400		
Insurance Expired . .	125		
Misc. Supplies and Services	700		
Sales Discounts . . . .	2,100		
Net Revenue (to Net			
Revenue Statement) .	4,325		
	<u>\$17,800</u>		<u>\$17,800</u>

The manner of determining the various amounts shown in this statement was explained in Chapter VIII. The net revenue figure, \$4,325, is carried to the net revenue statement to be distributed and appropriated in accordance with contractual agreements and at the discretion of the board of directors.

The simple exhibit shown above would not be considered a satisfactory expense and revenue statement for most purposes. In the first place the account form is rather technical, and the layman consequently finds it somewhat difficult to interpret a statement prepared in this way. The "report," or narrative form, has some advantages in this respect. Further, the above statement is much too condensed to form a satisfactory operating sheet. The computations and adjustments which gave rise to the item of trading revenue, for example, should be shown in some detail. The following exhibit shows the expense and revenue statement of the A. B. Co. prepared in the report form, and including the computation of the trading revenue figure (see page 195).

In this statement discounts on purchases and sales are treated as deductions from the cost of materials and total sales, respectively. This accounts for the fact that the amount of trading income is \$15,600 instead of \$15,800 as in the preceding exhibit. Accountants are not at all agreed as to the exact incidence or location of such discounts in the financial statements. Large rebates and allowances such as "trade" dis-

counts, are generally handled as shown below. Cash discounts, however, are often accorded different treatment. But in agreement with the explanation of such items given in Chapter IV the discounts in the above case are placed in the trading section of the expense and revenue statement.

## EXPENSE AND REVENUE STATEMENT — A. B. Co.

For Month ending August 31st, 1918

## Trading —

Total Sales . . . . .	\$76,400	
Deduct — Sales Discounts . . . . .	<u>2,100</u>	
Gross Trading Revenue . . . . .		\$74,300
Materials on hand August 1st . . . . .	\$80,000	
Purchases during August . . . . .	<u>40,600</u>	
	\$120,600	

## Deduct — Inventory of Materials

August 31st . . . . .	\$40,000
Inventory of Goods in Process August 31st . . . . .	8,000
Inventory of Finished Goods August 31st . . . . .	12,000
Purchase Discounts . . . . .	<u>1,900</u>

61,900

Cost of Goods Sold .

58,700

Trading Income . . . . .

\$15,600

## Manufacturing and Selling Costs —

Depreciation of Buildings . . . . .	\$ 350
Depreciation of Equipment . . . . .	300
Allowance for Doubtful Accounts . . . . .	330
Labor . . . . .	9,170
Fuel . . . . .	400
Insurance . . . . .	125
Miscellaneous . . . . .	<u>700</u>

Total . . . . .

11,375

Manufacturing Net Revenue . . . . .

\$4,225

## Other Income —

Rent from Building . . . . .

100

Total Net Revenue . . . . .

\$4,325

There are certain inaccuracies in the above statement — not affecting the concluding net revenue figure, however — which

should be noted. The total of manufacturing and selling costs is overstated by the amount of such costs applicable to the inventories of goods in process and finished goods as was explained in the preceding chapter. In other words a part of the stated deductions from the gross cost-of-materials figure constitutes an offset to overstated manufacturing and selling expense figures. The cost of materials is understated; and the total of other expense is overstated by the same amount. If an adequate system of cost accounts is in use in any case the statements may be prepared in such a way as to avoid such misstatements. Further, it is very unlikely that the amount of the discounts accepted on purchases during August is applicable to materials actually consumed in producing the finished goods sold during the month. If, however, it be assumed that the inventories of materials, goods in process, and finished goods are based upon net figures as far as the prices of materials are concerned, the entire amount of purchase discounts should be considered as a deduction from costs as was stated in Chapter VIII.

Since the A. B. Co. is assumed to be a manufacturing enterprise, there is some question as to the propriety of treating the cost of materials as a trading deduction from gross revenue. The cost of materials, it might be urged, is essentially a manufacturing cost. The procedure shown above can be justified only on the ground of an assumption that in the case of the A. B. Co. the element of manufacture is so slight that the company is, in many respects, very similar to a trading enterprise. The figures given in this case are in agreement with such an assumption. Of the total expense for the month (\$58,700 plus \$11,375) about eighty per cent is the cost of materials (ignoring the errors already referred to). But it must be admitted that even in cases where the cost of raw materials constitutes a very large part of the total expense the process of manufacture may very decidedly alter the nature and appearance of the materials used. In such cases, evidently, goods purchased and goods sold cannot from any viewpoint be said to be identical. Hence such an enterprise cannot be considered a trading company. For the sake of simplicity, however, the trading section in the above statement is presented in much the same form as would be suitable for a regular trading enterprise.

The particular way in which an expense and revenue statement should be arranged depends not only upon the type of enterprise involved in any case but also upon the use that is to be made of the statement. In general it is the operating management which is particularly interested in this exhibit. Other interests such as the directors, stockholders, or creditors may be concerned, however, and the form of the statement may well be varied somewhat to suit the needs of each class. For general purposes variations of the report form are probably the most usable.

In the case of a complex enterprise it is desirable to classify the items in the expense and revenue statement on departmental and functional bases much more elaborately than was done in the above illustrative case. The construction and analysis of such statements, and the uses to which a succession of these exhibits may be put, will be fully discussed in Chapter XXV.

#### THE NET REVENUE AND SURPLUS STATEMENT

This statement begins with the amount of net revenue as shown by the expense and revenue statement, and shows the disposition of this amount among the various interests that have claim to it. It shows, further, the adjustments which must be made in the proprietary equity because of variations in asset values which arise outside of regular operating transactions. In the case of a corporation this statement presents a record of the authorizations of the board of directors in regard to net revenue and surplus. If there are several distinct equities in the enterprise in any case it is desirable that the net revenue section be subdivided into as many parts as there are distinct classes of equities in order that the rights of each group of owners in the net revenue may be clearly presented.

In its simplest form this statement is an itemized presentation of the Net Revenue and Surplus accounts. In the case of the A. B. Co. the net revenue statement for the month of August — based upon the closing entries and accounts discussed in the last chapter — would appear as follows :



## NET REVENUE AND SURPLUS STATEMENT

A. B. Co., AUGUST 31, 1918

Commercial Interest . . . \$ 70	Net Revenue (from Ex-
Bond Interest . . . . 200	pense and Revenue State-
Dividends Posted . . . . 2,550	ment) . . . . . \$4,325
Taxes Accrued . . . . 250	
Surplus for Month . . . . <u>1,255</u>	
	<u>\$4,325</u>
	<u>\$4,325</u>

Arranged in narrative form this statement might be presented as follows :

## NET REVENUE AND SURPLUS STATEMENT — A. B. Co.

For Month Ending August 31st, 1918

Total Operating Net Revenue for Month (from Expense and Revenue Statement) . . . . .	\$4,325
Deduct — Taxes Accrued during August . . . . .	<u>250</u>
Net Income Accruing to the Private Equities . . . . .	\$4,075
Contractual Deductions —	
Net Commercial Interest Deductions . . . . . \$ 70	
Bond Interest Accrued during August . . . . .	<u>200</u>
	<u>270</u>
Net Proprietary Income . . . . .	\$3,805
Deduct — Dividends Declared . . . . .	<u>2,550</u>
Surplus for August . . . . .	<u>\$1,255</u>

There is some question as to the propriety of considering such items as commercial interest as belonging in the net revenue section rather than in the expense and revenue statement. As was explained in Chapter VII accruals of income in favor of individuals or interests furnishing capital to the enterprise in any case are not expense items according to strict logic. Expense charges measure the expiration of commodities and services *purchased* by the management and consumed in producing the revenue of a given period. Various equities — stockholders, bondholders, noteholders, etc. — furnish the capital which is used in making these purchases. The excess of revenues over expenses constitutes the return to these interests. This amount is distributed to the equities in accordance with the rights and

privileges which each class enjoys. From this standpoint all interest accruals are clearly in the same general accounting category as are dividends and other proprietary items. In some cases, however, it would seem somewhat unreasonable to insist that this logical analysis be followed in the statements. If, for example, ninety-five per cent of the capital in a particular case is furnished by the proprietors, contractual accruals of net revenue will be comparatively slight in amount; and such items can be included in the expense and revenue statement without serious error. In such a case the net revenue and surplus statement will be practically a proprietary sheet. Further, if the expense and revenue statement be conceived as a record of the stewardship of the operating officials and employees, and is used to fix their responsibilities, then interest on current borrowings can be considered an expense in so far as the operating management is really responsible for these borrowings.

Whenever contractual equities are significant in amount and run for long terms, however, the interest charges involved should be treated as net revenue items. If such charges are treated as expenses, the concluding figure of the expense and revenue statement will depend upon the particular scheme of financing employed as well as upon the results of business operation. This is entirely unreasonable. To include interest on bonds, notes, mortgages, etc. — together with gross revenues and expenses — under the general caption "profit and loss," as is done by so many accountants, is a practice which destroys in a large measure the value of the statements for managerial purposes. A simple illustration will perhaps serve to make clear the impropriety of such a procedure. The A. Co. has outstanding among other equities, bonds to the amount of \$100,000. Interest charges on these bonds amount to \$6,000 per annum. In 1916 this sum is included with the operating expenses in the so-called profit and loss statement. It happens that the bond contract contains a provision which permits bondholders to exchange their securities for preferred stock under certain conditions. During 1917 a considerable number of bondholders avail themselves of this privilege. Interest charges are thereby reduced to \$3,500. Operating expenses and revenues, it will be assumed, are exactly the same as in

1916. The profit and loss statement for 1917, however — which again includes interest charges with operating expenses — would show a net revenue greater than the 1916 balance by the amount of the decrease in interest charges. Could these statements as they stand be used for comparative purposes to determine the efficiency of the operating management?

The distinction between expense items and net revenue charges is of particular importance in connection with the preparation of the statements, for it is often on the basis of these statements that the operating management and the board of directors make the important decisions of business and financial policy. And other interests such as the individual stockholder and bondholder, or the prospective creditor or investor, usually see nothing of the accounting records with the exception of the statements. It is essential, therefore, that the important statements be prepared in such a way as to best serve the purposes of these various interests. The net revenue figure is one of the most significant amounts shown by the accounts; and accounting practices should be carefully scrutinized with a view to preserving the integrity of this figure. If returns to contractual equities are listed among the expenses the results of operation as such are obscured.

Tax accruals, as was explained in the last chapter, stand in an anomalous position in the accounting structure. The state does not furnish capital to the enterprise in any case, and hence tax payments do not represent a return to capital. As far as the logic of the case is concerned it would seem to be equally proper to place the deduction for taxes in the net revenue section or in the expense and revenue statement. Indeed the only entirely satisfactory treatment for taxes in the statements is to recognize this item as congruous with no other figure. But if the tax charge is not segregated it would seem to be the most rational procedure to place this item among the net revenue deductions as was done in the above case. Tax accruals represent a charge for which the manager is in no way responsible, and which in no way reflects upon the efficiency of operation. Hence this item should not be listed among the expenses. The present "excess-profits" and income taxes are certainly levies upon income, and are in nowise deductions from gross revenue.

In the second of the above exhibits the items are arranged according to priority of lien. This order is probably the most satisfactory. Although the net revenue and surplus statement is rather simple in this case it is evident that in the case of a large corporation having outstanding several types of stocks, bonds, and other securities the net revenue section of the financial statements would be an exhibit of considerable size and importance. In the case of a simple single-proprietorship or partnership, on the other hand, this statement may shrink to insignificant dimensions or even practically disappear.

In the illustrative case of the A. B. Co. no surplus appropriations have been assumed. In practice, however, both interest and dividend appropriations are often made from surplus, rather than from current income; and in some cases such distributions are even made from invested capital. Items of net loss or net gain may also be treated as deductions from or additions to surplus, as was previously explained; and the surplus balance may be subdivided into a number of special accounts by order of the board of directors. In such a case the surplus statement may be prepared as a distinct exhibit, showing accumulated as well as current surplus. The A. B. Co., however, has no accumulated surplus, and there are no appropriations and adjustments. Hence the surplus section in this case is rather a simple affair, consisting merely in the surplus figure for August. This figure represents the amount of net proprietary income which for the time being is retained in the business as investment. In later chapters surplus adjustments will be further discussed.

#### THE BALANCE SHEET

The balance sheet is the most important financial statement. This is true not only because the balance sheet is the basis of the entire accounting structure, but also because of the practical uses to which this statement may be put by the various interests involved in any case. A balance sheet, if properly prepared, furnishes invaluable information to directors, stockholders, bondholders, managers, prospective creditors and other interests concerned; for if the inventories and appraisals are correct this statement gives an accurate presentation of the

financial status of the business at the end of the accounting period.

The balance sheet, in its simplest form, may be called a "balance of balances." It is a summary of the general ledger after the process of closing the accounts is completed. It is only at this time that the books represent the actual state of affairs. Many of the expenses are accruing continuously, and the day after closing in any case the accounts will fail to represent the actual status of the enterprise to some extent. The longer the interval between inventories the larger and more numerous will be the discrepancies.

Arranged in the simple account form the balance sheet of the A. B. Co. on August 31st would appear somewhat as follows:

BALANCE SHEET  
A. B. Co., AUGUST 31, 1918

Real Estate . . . .	\$ 40,000	Capital Stock . . . .	\$170,000
Buildings . . . .	69,650	Bonds . . . .	40,000
Equipment . . . .	23,700	Notes Payable . . . .	8,700
Materials . . . .	40,000	Accounts Payable . . . .	13,730
Goods in Process . . . .	8,000	Rent . . . .	200
Finished Goods . . . .	12,000	Dividends . . . .	2,550
Cash . . . .	26,200	Labor . . . .	630
Accounts Receivable . . . .	10,670	Bond Interest . . . .	200
Notes Receivable . . . .	2,900	Reserve for Taxes . . . .	250
Securities Owned . . . .	4,000	Commercial Interest . . . .	50
Fuel . . . .	200	Surplus . . . .	1,255
Insurance . . . .	125		
Miscellaneous Supplies and Services . . . .	100		
Commercial Interest . . . .	20		
	<u>\$237,565</u>		<u>\$237,565</u>

The above statement shows simply the balances of the asset and equity accounts of the general ledger by account titles. Although it should be recognized that the balance sheet is always based upon these balances, the point should be emphasized that there is no reason why account titles should be exactly followed in the statement. Other individuals than bookkeepers and accountants wish to read the balance sheet; and since the account names are often abbreviated and technical, the items in the balance sheet may well be labeled with

longer and more intelligible titles. "Wages Payable," for example, would be a more appropriate balance sheet heading than "Labor." Further, the above statement shows no valuation accounts; and, as was explained in the preceding chapter, it is convenient to record some asset expirations by using valuation accounts. Still further, it is usually desirable to arrange the items on both sides of the balance sheet into subsidiary groups. Many of the important facts which a balance sheet should show can be ascertained only from a comparison of special groups of asset and equity items. The balance sheet of the A. B. Co., revised in accordance with these suggestions, and arranged in the report form, would appear as follows:

BALANCE SHEET — A. B. Co.

August 31st, 1918

*Assets*

Fixed:

Real Estate . . . . .	\$40,000	
Buildings . . . . .	\$70,000	
Less — Allowance for Depreciation of Buildings	<u>350</u>	69,650
Equipment . . . . .	\$24,000	
Less — Allowance for Depreciation of Equipment . . . . .	<u>300</u>	23,700
Total Fixed Assets . . . . .		\$133,350

Current Working:

Materials . . . . .	\$40,000	
Goods in Process . . . . .	8,000	
Finished Goods . . . . .	<u>12,000</u>	60,000
Total Working Assets . . . . .		

Current Liquid:

Cash . . . . .	\$26,200	
Accounts Receivable . . . . .	\$11,000	
Less — Allowance for Doubtful Accounts	<u>330</u>	10,670
Notes Receivable . . . . .	2,900	
Securities Owned . . . . .	4,000	
Interest Accrued . . . . .	<u>20</u>	
Total Liquid Assets . . . . .		43,790

## Sundry Current :

Fuel . . . . .	\$200	
Insurance Prepaid . . . . .	125	
Miscellaneous Supplies and Services . . . . .	<u>100</u>	
Total Sundry Assets . . . . .		425
Total . . . . .		<u>\$237,565</u>

*Equities*

## Capital :

Stock . . . . .	\$170,000	
Bonds . . . . .	<u>40,000</u>	
Total Capital Equities . . . . .		\$210,000

## Current Liabilities :

Notes Payable . . . . .	\$ 8,700	
Accounts Payable . . . . .	13,730	
Bond Interest Accrued . . . . .	200	
Commercial Interest Accrued . . . . .	50	
Taxes Accrued . . . . .	250	
Wages Payable . . . . .	630	
Dividends Payable . . . . .	<u>2,550</u>	
Total Current Liabilities . . . . .		26,110

## Deferred Credits :

Rent Prepaid (September and October) . . . . .	200	
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## Surplus :

August Balance . . . . .	<u>1,255</u>	
Total . . . . .		<u>\$237,565</u>

Some of the headings in the above statement require brief explanation. The term "working" is often applied to those assets such as raw materials which are made up into finished product and are in this way finally converted into other assets such as cash and accounts receivable. There is some question as to the propriety of listing finished goods under this head; for such goods represent the product ready for sale. The productive process, however, is not actually completed in any case until the sale has been made; and although this part of the process may cause little or no change in the physical nature of the goods involved, it is still a necessary step in production and requires certain definite costs. Liquid assets are assets which will either normally be converted *directly* into cash within a comparatively short time or at any rate *may* readily be so

converted. The securities which the A. B. Co. owns are included in this group on the basis of the assumption that they may be liquidated with ease. Fuel, unexpired insurance, supplies on hand and services prepaid are examples of assets which normally expire from use in business operation and cannot be easily liquidated in any other way. Among the equities the amount of rent paid in advance, although really a current liability, is set up under a special head because of its peculiar nature. This item will never be paid in cash but will be gradually retired as the A. B. Co. furnishes the use of a part of its equipment to the lessee.

Although it is somewhat difficult to establish lines of division among asset and equity items which can be consistently followed in all cases, nevertheless the arrangement of the balance sheet data into sub-groups is a matter of very considerable importance. Comparisons between fixed assets and capital equities, between liquid assets and current liabilities, between current assets and fixed assets, etc., are highly illuminating. The particular purposes to be served in any case should, of course, condition the nature of the balance sheet. The uses to which the sub-groups in a balance sheet may be put in making comparisons will be fully discussed in Chapter XXVI.

For certain purposes a much condensed balance sheet may be most adequate. The balance sheets published by large corporations are usually highly summarized. Care should be taken in preparing such general balance sheets that incongruous items are not grouped in such a way as to make misinterpretation very likely. Such captions as "real estate, goodwill, etc." for example, should not appear in any balance sheet. Certain combinations, however, are legitimate. The following is the balance sheet of the A. B. Co. in condensed form:

<i>Assets</i>		
Plant and Equipment . . . . .	\$134,000	
Less Allowance for Depreciation . . . . .	<u>650</u>	
		\$133,350
Materials and Other Working Assets . . . . .		60,000
Notes and Accounts Receivable . . . . .	\$13,900	
Less Allowance for Doubtful Accounts . . . . .	<u>330</u>	
		13,570



Securities . . . . .	\$ 4,000
Cash . . . . .	26,200
Sundry Assets . . . . .	<u>445</u>

*Equities*

Capital Stock . . . . .	\$170,000
Bonds . . . . .	40,000
Notes and Accounts Payable . . . . .	22,430
Dividends Payable . . . . .	2,550
Interest and Taxes Accrued . . . . .	500
Sundry Liabilities . . . . .	830
Surplus . . . . .	<u>1,255</u>
	<u>\$237,565</u>

Many other schemes of arrangement are possible. The equities, for example, may be classified in the balance sheet as proprietorship and liability items. When the account form is used, moreover, asset valuation items are often listed in the right-hand column among the equities, and equity valuation items — if there are any such — are placed in the asset column. The following statement represents — in summary form — the A. B. Co.'s balance sheet prepared in accordance with these suggestions:

ASSETS		EQUITIES	
Plant and Equipment . . . . .	\$134,000	Liabilities:	
Working Assets . . . . .	33,000	Notes and Accounts Payable . . . . .	22,430
Notes and Accounts Receivable . . . . .	13,900	Sundry Liabilities . . . . .	1,330
Securities . . . . .	4,000	Proprietorship:	
Cash . . . . .	26,200	Capital Stock . . . . .	170,000
Sundry Assets . . . . .	445	Surplus . . . . .	1,255
		Dividends Payable . . . . .	2,550
		Valuation:	
		Allowance for Depreciation . . . . .	650
		Allowance for Doubtful Accounts . . . . .	330
	<u>\$238,545</u>		<u>\$238,545</u>

The item of dividends payable is included among the proprietary items in this case on the ground that, although a legal liability, it represents a part of the present stockholders' equity.

A single balance sheet, although a very useful statement in that it shows the status of the enterprise in compact form, gives slight clue to the business process which has brought about this condition. But from a series of successive monthly or annual balance sheets, together with auxiliary information in regard to investment and distributions of net revenue, the accountant can reconstruct the important elements in the financial history of the enterprise in any case. Since the balance sheet is the "origin and terminus of every account,"<sup>1</sup> a series of such statements, properly interpreted, throws considerable light on the business process. In Chapter XXVII the construction and analysis of comparative balance sheets will be discussed.

#### THE TEN-COLUMN STATEMENT

As a first step in making up the financial statements the *ten-column statement* is a convenient working device. The exhibit on pages 208 and 209 illustrates such a sheet.

The ten-column statement begins in any case with the trial balance — a summary of ledger debits and credits. In the inventory columns appear such asset and equity inventories as are at variance with the trial balance figures. An analysis and combination of the trial balance and inventory figures give the data for the balance sheet and other special columns. The above statement is based upon the trial balance of the A.B. Co. appearing on page 152, and the inventories and adjustments already discussed in connection with this trial balance. It will be desirable to examine the construction of this exhibit in some detail, for the ten-column statement is an important working device.

The first account shown in the trial balance columns is Real Estate, with a debit balance of \$40,000. No new inventory is given, hence it may be assumed that the value of this type of property is unchanged. There has been no expiration of value; hence there is no expense charge to be considered in connection

<sup>1</sup> Sprague, *Philosophy of Accounts*, p. 26.

## TEN-COLUMN STATEMENT — A. B. Co.

August 31, 1918

L. F.	Account Titles	TRIAL BALANCE		INVENTORIES		BALANCE SHEET		EXPENSE AND REVENUE		NET REVENUE AND SURPLUS	
		Dr.	Cr.	Dr.	Cr.	Assets	Equities	Dr.	Cr.	Dr.	Cr.
	Real Estate	\$ 40,000	\$	\$	\$	\$ 40,000	\$	\$		\$	\$
2	Buildings	70,000		69,650		70,000		350			
3	Allowance for Depreciation of Buildings										
•	Equipment						350				
4	Allowance for Depreciation of Equipment	24,000		23,700		24,000		300			
4	Materials										
5	Goods in Process	120,600		40,000		40,000		80,600			
12	Finished Goods			8,000		8,000			8,000		
13	Cash			12,000		12,000			12,000		
8	Accounts Receivable	57,900	31,700			26,200					
16	Allowance for Uncollectible Accounts	24,800	13,800	10,670		11,000		330			
18	Notes Receivable										
21	Securities Owned	8,500	5,600			2,000					
23	Labor	5,000	1,000			4,000					
26	Fuel	8,540									
28	Insurance	600		200		200		9,170			
29	Miscellaneous Supplies and Services	250		125		125		400			
36	Sales Discounts	800		100		100		125			
		2,100						700			
								2,100			

## TEN-COLUMN STATEMENT — A. B. Co. (continued)

August 31, 1918

L. F.	Account Titles	TRIAL BALANCE		INVENTORIES		BALANCE SHEET		EXPENSE AND REVENUE		NET REVENUE AND SURPLUS	
		Dr.	Cr.	Dr.	Cr.	Assets	Equities	Dr.	Cr.	Dr.	Cr.
38	Purchase Discounts	\$	\$ 1,900	\$	\$	\$	\$	\$	\$ 1,900	\$	\$
40	Sales		76,400						76,400		
45	Rent		300						100		
47	Commercial Interest		30				200			70	
50	Bond Interest	70		20		20	30			200	
53	Reserve for Taxes						200			250	
60	Dividends						250			2,550	
65	Capital Stock						2,550				
67	Bonds		170,000				170,000				
68	Notes Payable	6,300	40,000				40,000				
75	Accounts Payable	11,200	15,000				8,700				
77	Net Revenue		24,930				13,730	4,325			4,325
80	Surplus	\$380,660	\$380,660			\$238,545	1,255	\$08,400	\$08,400	1,255	\$4,325
						\$238,545	\$238,545	\$08,400	\$08,400	\$4,325	\$4,325

with this asset. The trial balance figure, therefore, since it is identical with the present value of the real estate, is carried directly to the asset column of the balance sheet. In the case of the next account, Buildings, a new inventory is given. The present value of this asset is \$69,650. The difference between the new inventory and the debit balance of the Buildings account represents the amount of depreciation expense for the past period as far as this asset is concerned. This difference, \$350, is accordingly carried to the expense column. The new inventory figure, however, is not carried to the balance sheet. A valuation account, Allowance for Depreciation of Buildings, is used in this case. The balance in the Buildings account is carried to the asset column, and the expiration is indicated by placing the valuation item, \$350, among the equities. The two accounts taken together now indicate the actual present value of the asset. The accounts Equipment, and Allowance for Depreciation of Equipment, are handled in the same way. Neither of these valuation accounts appears in the original trial balance because, as previously explained, the company involved has been operating for a single period. In preparing a ten-column statement at the end of the next accounting period any new items of depreciation would be added to the balances then appearing in the valuation accounts, and the totals thus determined would be carried to the equity column. The new depreciation charges would be listed in the expense column.

The Materials account shows a debit balance of \$120,600. The present inventory is \$40,000. The inventory figure is listed among the assets; the difference between these amounts is carried to the expense column. As has already been explained, this difference does not represent the actual cost of materials for the period. As a matter of clerical efficiency in working out a ten-column statement, however, it is convenient to treat each account as a unit, without reference to any other heading. When this is done any overstatement of expense or revenue under one head is offset by an equal understatement in some other connection, and *vice versa*. In this case the inventories in connection with Goods in Process and Finished Goods are used to adjust overstated costs as was previously explained. These accounts show no trial balance figures. The inventory items,

therefore, are carried to the balance sheet as they stand. These same amounts must also be listed in the revenue column as cost adjustments.

Since no new cash inventory is given it may be assumed that the net debit balance as shown by the trial balance represents the cash actually on hand. Hence there is neither expense nor revenue in connection with this property item. The debit balance, \$26,200, is carried to the asset column. If cash had been lost or stolen the inventory would not have coincided with the balance of the Cash account, and an "extraordinary" expense would have arisen. Notes Receivable and Securities Owned are also accounts which show in the trial balance the exact present status of the assets involved. The balances of these accounts, accordingly, are listed in the asset column. There is an inventory in connection with Accounts Receivable, however, which is \$330 less than the net balance of the account. This difference is listed in the expense column as a charge against revenue. The actual balance is carried to the asset column; and the amount of the expiration is listed among the equities under the head, Allowance for Uncollectible Accounts. As was explained in another connection it is essential that a valuation account be used in such a case.

The Labor account shows a liability inventory. The debit total in this account indicates the total amount of labor services purchased and paid for during the period. As was explained in Chapter VIII, the credit or liability inventory shows that this entire amount of labor services has been consumed during the period and that in addition services have been used to the amount of \$630 for which payment has not yet been made. Then the total amount of labor expense is the debit total of the Labor account plus the inventory representing wages unpaid, or \$9,170. This amount is carried to the expense column. The inventory figure, \$630, represents a current right against the assets of the company and is accordingly listed among the equities. Fuel, Insurance, and Miscellaneous Supplies and Services show asset inventories in each case. The inventory figures are carried to the asset column. The difference between the inventory and the trial balance amount in each case is expense, and this difference is listed among the expenses. If no

*inventories had been given in connection with these three accounts the reasonable assumption would be that the net trial balance figure in each case constituted an expense rather than an asset figure. This follows from the nature of the commodities and services involved.*

Purchase and sales discounts are offsets to goods purchased and sold as was previously explained. They are current valuation items and should be carried to the expense and revenue columns to adjust overstated costs and revenues. Since such items are neither asset nor equity balances they do not appear in the balance sheet.

The Rent account shows a credit balance of \$300. If there were no inventory item given it would mean that this entire amount were revenue, and should be carried to the revenue column. In this case there is a liability inventory of \$200. The amount of revenue for this period, therefore, is but \$100. The inventory figure is listed among the equities. The different types of inventories possible in connection with the Rent account were explained in the preceding chapter.

Items of interest should be considered as net revenue debits and credits as was explained in the last chapter. The net balance of Commercial Interest, then, after being adjusted by the inventories, is carried to the debit column of the net revenue and surplus statement. The liability inventory is listed in the equity column and the asset inventory is carried to the asset column. The beginner is inclined to wish to combine these items and show only the difference in the balance sheet. This should never be done. These columns should show *all* asset and equity items, and hence no cancellation is proper. Obviously one entire column of the balance sheet might be cancelled against the other, since the totals are the same, and this procedure would destroy the statement. Any algebraic summation of asset and liability items is simply a step in this direction.

The Bond Interest account does not appear in the trial balance. There is an inventory item in connection with this account, however, representing bond interest accrued but unpaid. This item is clearly an equity balance and is carried to the balance sheet. It is also an accrued deduction from net revenue, and hence is listed in the debit column of the net revenue and surplus

statement. Similarly no figures appear in the trial balance for dividends and taxes. Among the inventories, however, are listed a dividend appropriation of \$2,550 and a tax accrual of \$250. The dividend inventory is an equity item and is accordingly carried to the balance sheet. It is also a distribution of net revenue. The tax accrual is a government claim and is also listed among the equities. It is carried to the net revenue columns because it constitutes a deduction from net revenue as was explained in the preceding chapter.

Capital Stock, Bonds, Notes Payable, and Accounts Payable are typical equity accounts. No inventories or adjustments have been assumed in connection with these accounts; and hence the net balances as shown by the trial balance statement are carried directly to the equity side of the balance sheet.

Starting with a trial balance that "proves" the numerical computation involved in a ten-column statement is shown to be correct if the final balance of the net revenue and surplus columns added to the equity side of the balance sheet (the asset side in the case of a net deficit) equates resources and equities. The asset column shows the present status of all assets; but the equity column does not include the unappropriated net revenue balance. The total of the equities to date is not discovered until the balance of the net revenue and surplus columns is incorporated with the surplus from the preceding period. When this is done assets again equal equities. In the illustrative case of the A. B. Co. there is no accumulated surplus. Hence the surplus for August, \$1,255, is also the balance of the Surplus account.

To aid the student in working out such statements as the one just discussed a few general suggestions may be given at this point. It is evident that whenever a debit or asset inventory is given in connection with an asset account, the inventory figure is carried as an asset to the balance sheet (assuming that there is no valuation account), and the *difference* between the inventory item and the net amount shown by the trial balance constitutes the expense item that is carried to the expense column. If a valuation account is used the book value of the asset (the amount appearing in the main asset account) is listed in the asset column. The amount of the expiration is



added to any credit balance already found in the valuation account, and the sum so determined is carried to the credit column of the balance sheet. Where a valuation account such as Allowance for Depreciation is found in the trial balance care must be taken that the *net* book value of the asset — *i.e.*, the difference between the amount appearing in the main asset account and the balance already shown in the valuation account — be compared with the new inventory in determining the amount of expense. If the amount of the new inventory is greater in any case than the net book value appearing in the trial balance this means that appreciation has occurred. The amount of the increase in such a case should be carried to the revenue column if it can be considered as applicable to the current period. If this is an unusual happening, or covers several accounting periods, the item of appreciation should be listed in the credit net revenue or surplus column. The increased inventory may be listed as an asset, or the amount of the increase may be deducted from the balance appearing in the appropriate valuation account if there is such an account.

Whenever there is a liability or credit inventory in connection with a current asset or expense account, there is no asset to carry to the balance sheet. The liability inventory figure is listed among the equities, and the *sum* of the inventory and the balance of the account as shown by the trial balance is carried to the expense column. Inventories in connection with net revenue accounts are handled in the same way except that the adjusted figure is carried to the appropriate net revenue column. Whenever an asset inventory is given, such as the goods in process inventory in the above case, and there are no corresponding trial balance figures, the amount of the inventory is listed among the assets and is also placed in the revenue column to offset overstated expense charges. If such an inventory represented a gift or donation the corresponding credit would be carried to the net revenue columns.

It should be borne in mind that there is nothing arbitrary about such a device as the ten-column statement. It involves simply a particular method of distributing debit and credit items. The trial balance shows an equality of debit and credit totals. These debit and credit balances, adjusted by means

of inventories, are distributed as assets and equities, as expense and revenue charges and credits, and as net revenue and surplus items. Each inventory adjustment affects the sum totals of debits and credits alike. The underlying equation is thus at all times maintained; and by striking a final balance, as explained above, the accuracy of the work is proved. From a completed ten-column statement the regular balance sheets and other statements previously described may be readily prepared.

## THE WORKING SHEET

Although the ten-column statement is a convenient clerical device it is not in common use. Accountants quite generally employ another form of "working sheet" which includes more or less of the closing entries and an "adjusted" trial balance. Because of its wide use the student should be familiar with the general characteristics of this form. An illustration will serve to explain the nature of the working sheet and the way it is constructed from an underlying trial balance and accompanying inventories.

The following is the trial balance of C. A. Black, Proprietor, as of December 31st, 1917:

ACCOUNTS	Dr.	Cr.
Accounts Payable . . . . .	\$	\$ 10,600
Accounts Receivable . . . . .	29,000	
Cash . . . . .	8,200	
C. A. Black, Capital . . . . .		22,500
Interest Received . . . . .		500
Interest Paid . . . . .	800	
Merchandise Inventory . . . . .	20,000	
Miscellaneous Expense . . . . .	1,300	
Notes Payable . . . . .		12,000
Office Equipment . . . . .	800	
Other Selling Expense . . . . .	3,500	
Office Salaries . . . . .	4,700	
Purchases . . . . .	87,000	
Purchase Returns . . . . .		1,300
Rent . . . . .	600	
Store Equipment . . . . .	3,000	
Sales . . . . .		128,000
Sales Returns . . . . .	2,500	
Salesmen's Salaries . . . . .	12,000	
Sales Discounts . . . . .	1,500	
	<u>\$174,900</u>	<u>\$174,900</u>

## WORKING SHEET—C. A. BLACK, Proprietor

As of December 31, 1917

Account Titles	TRIAL BALANCE		ADJUSTING ENTRIES		ADJUSTED TRIAL BALANCE		- BALANCE SHEET		EXPENSE AND REVENUE	
	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Assets	Equities	Dr.	Cr.
Accounts Payable	\$	\$ 10,600	\$	\$	\$	\$ 10,600	\$ 10,600	\$	\$	
Accounts Receivable	29,000				29,000		29,000			
Cash	8,200				8,200		8,200			
C. A. Black, Capital		22,500				22,500		22,500		
Interest Received		500	(a)	30		530				
Interest Paid	800		(b)	110	910				910	
Merchandise Inventory	20,000		(c)	3,000	23,000		23,000			
Miscellaneous Expense	1,300				1,300				1,300	
Notes Payable		12,000				12,000		12,000		
Office Equipment	800				800		800			
Other Selling Expense	3,500				3,500				3,500	
Office Salaries	4,700		(e)	150	4,850				4,850	
Purchases	87,000				87,000				87,000	
Purchase Returns		1,300				1,300				1,300
Rent	600				600				600	
Store Equipment	3,000		(f)	40	3,000		3,000			
Sales		128,000				128,000				128,000
Sales Returns	2,500				2,500				2,500	
Salesmen's Salaries	12,000		(g)	320	12,320				12,320	
Sales Discounts	1,500				1,500				1,500	
	\$174,000	\$174,000								

WORKING SHEET — C. A. BLACK, Proprietor (continued)  
As of December 31, 1917

Account Titles	TRIAL BALANCE		ADJUSTING ENTRIES		ADJUSTED TRIAL BALANCE		BALANCE SHEET		EXPENSE AND REVENUE	
	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Assets	Equities	Dr.	Cr.
Accrued Interest Receivable	\$		(a) 30	110	\$ 30	110	\$ 30	\$	\$	
Accrued Interest Payable			(b) 110							
Expense and Revenue			(c) 3,000			3,000				3,000
Depreciation Expense			(d) 380		380				380	
Allowance for Depreciation			(e) 150			150		380		
Office Salaries Payable			(f) 40		40		40		150	
Prepaid Rent			(g) 320			320			320	
Salesmen's Salaries Payable			(h) 260		260				260	
Taxes										
Taxes Accrued									260	
Net Profit								\$46,320	\$115,080	
								17,750	17,750	
								\$64,070	\$132,830	\$132,830

The inventories and adjustments are as follows : merchandise, \$23,000; taxes accrued, \$260; office salaries due but unpaid, \$150; salesmen's salaries unpaid, \$320; interest accrued on bank balance, \$30; interest accrued on notes payable, \$110; rent prepaid, \$40; store equipment, \$2,700; office equipment, \$720.

The exhibits on pages 216 and 217 illustrate a working sheet prepared from the above data.

The type of working sheet illustrated above may conveniently be used for the purpose of constructing adjusting entries, and to prove the clerical accuracy of this work. The adjusted trial balance shows the condition of the ledger after all necessary special accounts have been opened, but before the various expense and revenue items have been combined in a summary account, and before the amount of net income has been transferred to the various equity accounts. Such an intermediate trial balance is of advantage as a test for accuracy in any case in which the closing entries are very numerous and complex. The letters used in the columns containing the entries serve to connect the corresponding debit and credit items.

An advantage which this form of working sheet has over the ten-column statement shown in the preceding section lies in the fact that the various adjustment headings are presented. This procedure makes it possible to interpret the statement more easily than if several distinct facts were listed under a single head. In the illustrative ten-column statement, for example, expense and liability items are shown in a single line with the trial balance figure of the Labor account and its inventory. In the more common form of working sheet the liability item would be set up under a distinct head such as "Accrued Wages Payable." The simplicity of the ten-column statement, however, and the fact that it shows the inventories, make this form in some respects the more usable device.

In the above working sheet no distinction is made between expense and revenue and net revenue items. This is typical of actual practice. Most accountants prepare a working sheet as a proprietary statement, the concluding net figure being the net proprietary income. As already explained, however, to

include interest charges — a return to capital — and taxes — a net revenue deduction rather than an operating deduction — with the expense charges, is a practice which conforms neither to logical relationships nor to practical considerations in many cases.

## X

### THE DETERMINATION OF NET REVENUE

IN the discussion of the closing and interpretation of accounts in Chapter VIII the general problem of ascertaining net revenue was raised. It was shown that in any case the trial balance — a summary of the open ledger accounts — does not alone furnish the data from which may be determined either the present financial status of the business or the expenses and revenues for the past accounting period. It is necessary to take inventories and to make adjustments in order to ascertain the accruals of cost and income and the current condition of all properties and property rights. In other words, the data of the business process must be carefully analyzed at the end of each period so that each item may be allocated to its proper place in the accounts and statements. In this connection many difficult problems of interpretation and classification arise. In this chapter some of the more important of these topics will be discussed — particularly as regards the relation of each question to the integrity of the net revenue figure.

### THE SIGNIFICANCE OF NET REVENUE

In an important sense the final goal of accounting in any case is the *net revenue figure*. It is net revenue (or net loss) which measures the change in the status of the private equities during a given period. It is this amount which reflects the ownership phase of the results of the business process. Increase in wealth — which is measured in the accounts by the net revenue figure — is the purpose of the business enterprise from the standpoint of the individual owners. Since the accounts are kept primarily from this standpoint it might be said that nearly all questions of accounting analysis center around the determination of net revenue.

The net revenue figure is the amount available for partition among the various individuals and interests that furnish the capital in any case. It may not always be either expedient or possible, however, to withdraw this sum in cash or an equivalent. (See the following section.) In such an event net revenue may be retained as new investment, each equity account being credited with its proper share. A partnership, for example, shows in its accounts a net revenue of \$10,000 for the year. Assuming that there are no liabilities on which interest accrues this amount is available for division among the partners, A and B. It may be, however, that the demands upon the firm's current assets because of the need for additional equipment are so great that there is little cash available for dividends. Further, it may be that it would be unwise to borrow at this time. If such is the case the net revenue figure may be disposed of by credits to the partners' accounts in accordance with the articles of copartnership.

It is particularly important that net revenue be accurately determined at the end of each accounting period in the case of a business organization which acquires its capital from several distinct classes of investors. (See Chapter I.) A particular corporation, for example, may have outstanding as equities not only stocks, bonds, and notes, but several types of stocks and bonds. If net revenue is not accurately determined each year not only are transient individual owners likely to be misled but the interests of an entire class of investors such as the income bondholders, for example, may be jeopardized. In the case of a small single-proprietorship, on the other hand, where practically the entire investment is the proprietor's, this problem of equities does not arise.

In so far as net revenue summarizes the results of the efforts of the operating management and the employees, this figure may be used for comparative purposes as a rough test for efficiency. If net revenue be broadly defined, however, as representing the net change in the status of the equities, this figure cannot as a rule be said to show merely the results of operation in the technical sense. The speculative accidents of the situation are also involved. This topic will be further discussed in a later section of this chapter.



The nature of net revenue and its relation to the other fundamental concepts of accounting was explained in Chapter III. In this connection it will be desirable to review this matter briefly. The business enterprise secures from the various investors a sum of cash or an equivalent. These funds are invested in plant, equipment, raw materials, etc. To work up the raw material into a finished product it is necessary to hire laborers, buy supplies, and secure other commodities and services. All such items are purchased with part of the original cash, with new capital, or on credit. As production is accomplished sales are made of the finished product and current assets such as cash, accounts receivable, etc., are received in exchange. As these current assets become cash they may be used again to buy more material and the other necessary commodities and services. Ignoring price changes it might be said that the excess of all assets received from sales (and from speculative and accidental opportunities) within a given accounting period, over the amount of fixed assets expired, materials used, and other commodities and services consumed in producing these sales (or otherwise destroyed) constitutes net revenue. It is the return to the investor for the services he performs — a remuneration for the burden of ownership. In the accounts this amount is represented by the balance of the expense and revenue accounts.

Net revenue is a part of the economist's "cost of production." At least it is a component of the price which the consumer pays. It is not, however, nor any portion of it, an expense of the business enterprise. The confusion of expense and economic cost is one of the most common errors made by accountants. An expense arises because of the expiration of some commodity or service *purchased* by the enterprise. The enterprise does not buy the services of the owners. Nor does any one owner such as the stockholder buy the services of other owners such as bondholders. Rather it may be said that each investor *furnishes* his service in anticipation of a return on his investment due to the fact that revenues normally exceed expenses. In other words interest and dividends are in essentially the same accounting category, as was previously explained, and are charges against *net* revenue rather than *gross* revenue.

The nature of the service which the investor furnishes differs

widely in various enterprises. In single-proprietorships and partnerships the proprietors often not only assume the management of the enterprise but furnish a large part or even all of the ordinary labor services as well. In such a case net revenue is clearly not synonymous with the interest and profit of economic theory. The four principal distributive shares, wages, rent, interest, and pure profit, may all be represented. In the corporation, on the other hand, labor services and management may be purchased for the most part from individuals who furnish no capital and hence do not have equities in the enterprise in the ordinary sense. It is often urged that accounts should be set up which charge as expense a reasonable return for the proprietor's labor and a reasonable interest allowance for the capital he furnishes. Such fictitious accounts are practically useless, and usually do more to confuse the owner than to instruct him. If the proprietor works in his store from six o'clock in the morning until ten at night he is perfectly well aware of that fact. What he wishes to know is the return he is making on his business and his efforts. If this return does not give him a reasonable rate on his investment and decent wages for his work he does not need a special ledger account to tell him that fact. For the purposes of financial accounting there is little need of separating net revenue into its economic elements.

Further, the use of fictitious expense accounts, if actual errors are avoided, does not affect the net revenue figures. Suppose, for example, that an "expense" account, Interest on Capital Owned, be charged with an amount equal to six per cent on the investment. In what account is the concurrent credit incident? Clearly some revenue account must be credited with the same amount; and this procedure does not affect the net revenue figure in any way. If an account in some other classification is credited the net revenue figure will not be correctly stated.

In connection with income taxes cases arise in which the use of fictitious expense accounts seems at least partially justified. A particular tax, for example, may be levied upon net proprietary income, and may fall upon all types of business organizations without discrimination. In such a case the corporation which buys labor services and management has an advantage over the single-proprietorship where the proprietor is at once in-

vestor, manager, and common laborer. In the case of the corporation the stockholder's dividend may be largely interest and pure profit. In the case of the single-proprietorship the proprietor's net income may be in large measure wages. To avoid injustice in such cases it would seem reasonable to allow the proprietor in the small concern to charge expense with a reasonable salary for his own services. If he does not withdraw this salary in cash, however, the corresponding credit should be entered in a surplus or other proprietary account. This transaction can be conceived in this way: one expense of running the business is the salary of the manager who is also an owner; but instead of withdrawing this salary the proprietor immediately invests this amount in the business. Such a transaction does not reduce the proprietor's return. It simply divides his income between wages and return to capital.

In general it is unwise to attempt in the accounts to divide either total net revenue or net proprietary income into its economic elements.<sup>1</sup> This is a part of the individual investor's economy; and it can be safely left to the individual.

#### THE CASH STATEMENT

The expense and revenue statement should exactly represent the operating situation for a particular accounting period. That is, this statement should show revenues and expenses *accrued* in the fiscal period just past. All commodities and services *consumed* in the period constitute the total expense; all revenues *earned* during the period constitute total revenue. Thus a distinction should be sharply drawn between statements of cash receipts and expenditures, and of expenses and revenues.

This point needs further elaboration, for in actual practice the distinction is not always recognized. Particularly in municipal enterprises is the treasurer's report accepted in lieu of an expense and revenue statement. In most cities the statement from which the budget for the ensuing fiscal period is prepared

<sup>1</sup> In cost accounting problems arise which involve the computation of interest on investment as a cost. It is doubtful even in such cases, however, if such computations should be set up in the accounts. See Chapter XXIX.

is that of receipts and disbursements. This is merely a statement of cash received and paid out during the year — in other words an itemized Cash account. It reflects the stewardship of the officers in regard to one kind of property — cash. This is clearly not the same information as that shown by an expense and revenue statement. Cash disbursements and expenses are not synonymous terms. Payments are often made for permanent improvements which are not expenses. Disbursements may be made in one year to cover the expenses of a previous year. Similarly, the expenses of a particular period often do not appear among the current disbursements, but will be paid in later periods. Further, certain expenses may not involve expenditure for years, if ever. An example of such an expense is the depreciation of durable property. Depreciation may be regularly charged to operating expense and yet no replacements may occur for a long period. The situation in regard to revenue earned as compared with cash receipts is analogous.

An illustration will perhaps make the distinction between these different kinds of information entirely clear. The officials of an urban water company petition the city council that the company be allowed to raise the rates to its customers. They urge that the company is being operated at a deficit, and furnish, to support their contention, the following statement of receipts and disbursements:

## THE A. Co., December 31, 1917

*Receipts*

Cash on hand December 31, 1916 . . . . .		\$21,400
Quarterly Rates . . . . .	\$33,967	
Metered Water . . . . .	14,722	
Mason Work . . . . .	836	
Metered Rentals . . . . .	170	
Miscellaneous . . . . .	71	
Bank Loan . . . . .	1,000	
Sale of Abandoned Property . . . . .	<u>5,500</u>	

Total Receipts for the year . . . . .		<u>56,266</u>
		<u>\$77,666</u>

*Disbursements*

## Operation :

Pumping Station Expense . . . . .	\$ 6,402
Fuel . . . . .	5,061
Office and Distribution Expense . . . . .	10,072
Rebates and Stoppages . . . . .	605

## Maintenance :

Repairs to Distribution . . . . .	607
Repairs to Pumping Station . . . . .	644
Repairs to Meters . . . . .	581

Interest on Bonds . . . . .	15,000
Sinking Fund Installment . . . . .	15,000
New Extension . . . . .	18,000
Insurance . . . . .	<u>414</u>

Total Disbursements for the year . . . . .	<u>72,386</u>
Cash on hand December 31, 1917 . . . . .	\$ 5,280

On the basis of the above figures the company contends that the water plant has been operated at a deficit for the year of \$16,120 (the shrinkage in cash), and asks that the water rates be raised.

A careful examination of the items in this statement will serve to throw some light upon the propriety of the company's petition. All of the items shown among the receipts of the current year appear to be from revenue sources with two exceptions. The amount realized from the sale of abandoned property is evidently not a revenue; it represents a receipt from the sale of part of the capital equipment, and it is likely that a large element of expense is involved in the transaction. And the amount borrowed from a bank is not a revenue; revenue cannot be earned by borrowing. Among the disbursements the sinking fund installment clearly does not represent expense. Sinking Fund is not an expense account, but represents rather a special fund of assets set aside to redeem bonds or for some other purpose. Even if this fund were immediately used to retire some equity the expenditure would in nowise be an expense charge. Revenue cannot be earned by contracting debts; neither is expense incurred by paying debts. "New Extension, \$18,000" represents quite evidently an expenditure for capital improvements, and hence should not be included among the

expense items. Further, the amount paid as bond interest represents a distribution of either net revenue or capital to a contractual equity, and hence cannot be considered an operating expense.

The following table represents the expense and revenue statement for the year constructed from the cash book records in accordance with the above suggestions:

<i>Revenue</i>		
Quarterly Rates . . . . .	\$33,967	
Metered Water . . . . .	14,722	
Mason Work . . . . .	836	
Meter Rentals . . . . .	170	
Miscellaneous . . . . .	<u>71</u>	
Total . . . . .		\$49,766
<i>Expense</i>		
Operation:		
Pumping Station Expense . . . . .	\$ 6,402	
Fuel . . . . .	5,061	
Office and Distribution Expense . . . . .	10,072	
Rebates and Stoppages . . . . .	605	
Maintenance:		
Repairs to Distribution . . . . .	607	
Repairs to Pumping Station . . . . .	644	
Repairs to Meters . . . . .	581	
Insurance . . . . .	<u>414</u>	
Total . . . . .		<u>24,386</u>
Net Revenue . . . . .		\$25,380

This statement shows a net revenue for the year of \$25,380, as compared with a deficit in cash of \$16,120. After the interest charges of \$15,000 are met there remains of net revenue the amount of \$10,380, the net proprietary income. Although this income has evidently not been realized in cash it may well be that it amounts to a fair return upon the stockholder's investment.

The above expense and revenue statement, however, is probably inaccurate. Although an itemized statement of receipts and disbursements gives some clue to expenses and revenues, it is not possible to revise any cash statement in such a way as to make it a dependable income sheet. Depreciation for the year,

for example, is not taken into consideration. Further, the statement of revenue assumes that revenue earned during the fiscal period coincides with cash receipts from revenue sources. This is a very unlikely situation. Doubtless some of these receipts represent revenue earned in the preceding period; and it is probable that the receipts do not include all the revenues accrued within the current period. No doubt an analogous situation exists in regard to the expense items. This emphasizes the need for distinct expense and revenue records. The success or failure of operation for a given fiscal period can only be shown by a statement of revenue earned and expense accrued in that period. The excess of cash received over cash disbursed for the year, or *vice versa*, usually bears little relation to net revenue or net loss for the period.

#### DEFERRED CHARGES AND CREDITS

It has been stated above that the expense and revenue statement should include all the expenses for the period covered by the statement. It occasionally seems advisable, however, to treat certain extraordinary charges as items applying not solely to the particular period in which the expense is first recognized, but to several periods. Suppose, for example, that because of rapid changes in mechanical technique, an electric power company finds a number of dynamos obsolete, even though this property has suffered little physical deterioration. It becomes necessary to replace with the improved types, it may be assumed, property to the amount of \$50,000 which is almost new. Assuming a scrap value of \$8,000 this means an expense for the year of \$42,000. The management may with reason argue that this is an unusual expense, unlikely to occur again, or at least not oftener than once in several years. Consequently it would seriously distort the expense and revenue statement and the resulting net revenue figure to charge the entire amount into the expense of a single year. Therefore it is decided in this case to charge but \$10,000 of this expense against the revenue of the current year, and to carry \$32,000 on the asset side of the balance sheet as a *deferred expense*. This may be considered an entirely legitimate procedure; and deferred expense items are very fre-

quently met with in accounting practice. Such items, however, should not be confused with the assets. A deferred expense of this type is not an asset, but a deduction from the equities which the management has not been willing to recognize as a current deduction, although the loss has actually occurred. The desire to preserve financial standing, and a reasonably even flow of income, is the usual excuse for such deferred items.

The following is a somewhat different illustration. A firm has been involved in litigation for three years. The company's lawyers have been paid nothing but retaining fees. The case is settled and the lawyers are paid \$25,000. It seems evident that this is an expense, not of any one year, but of the three years. If it were possible to forecast this expenditure the most desirable procedure would be to charge the revenue of each year with one-third of the total expense. It is not likely, however, that the management could accurately estimate in advance the length of the suit or its cost. In this event the item — when finally paid — may be carried as a deferred expense if it is so large as to seriously affect the current statement of income.

The final disposition of these deferred expense items is a matter of importance. Such charges, evidently, should not be carried indefinitely on the books, but should be transferred as soon as convenient to current revenue or to accumulated surplus. In general it would seem best to close these balances against annual or accumulated surplus. A deferred expense is really a deduction from proprietorship which should have been provided for by charges to revenue during the years in which the loss might be said to be accruing. Since this was not done, earlier income sheets have been incorrect to some extent. But to load these charges upon the results of operation in *succeeding* periods would seem to be an improper method of making the correction. If losses accruing in previous periods are charged against current revenue a new error is made. It is better practice to dispose of such deferred expense balances by means of credits to the deferred expense account and charges to unappropriated surplus.

The balance sheet of almost every large corporation shows one or several deferred expense items. Chary use should be made of such accounts, however, and only in unusual circumstances should an item which represents an actual deduction



from equities be carried in *suspense*, instead of being charged against current revenue or present surplus.

Deferred charges — so-called — of a different type from the above cases frequently occur. Such are expenditures for services from which the benefit is not exhausted for a long period. A common illustration is the expenditure for stripping “overburden” in the case of certain kinds of mining properties. In the porphyry copper mines of Nevada, for example, the earth — which may be many feet deep — must be removed from a large area before the actual process of mining the ore can begin. Once the overburden is removed, the ore is mined very rapidly with steam shovels, and no further expenditure need be incurred for stripping as far as that portion of the ore body is concerned. It may take one or two years to remove the top earth; and in that time not a pound of ore is mined, nor a cent of revenue received. It is common practice in such a case to carry the costs of stripping on the balance sheet as a deferred debit item. It should be emphasized, however, that such an item is really neither an expense nor a loss, but rather an asset, representing the value of a service purchased and paid for, but not yet consumed. It is an expense of mining *all* the ore much as all capital outlay is an expense of earning the revenue throughout the life of the property; and it should be charged as an expense currently, in proportion to the weight of ore mined, revenue received or some other appropriate basis, in the same manner as any expiration of property due to business operation is charged.

Although the general distinction between an actual deferred asset and an expense or loss is clear, it is sometimes hard to draw the line in specific cases. Suppose, for example, that a firm maintains a department for the purpose of making tests and experiments with a view to developing new processes and methods. Are the necessary expenditures properly chargeable to an asset account, or should they be considered an expense? In so far as such a department is a permanent adjunct of the business, and is necessary to keep the firm abreast of competitors, such expenditures are clearly expense outlays — a current cost of operation. It is often urged, however, that if the experiments can reasonably be expected to result in a profitable process the costs should be carried as a deferred asset in the balance

sheet. In general it would seem more reasonable to charge such outlays against current revenue — unless the net revenue figure is thereby seriously distorted. If the experiments result favorably it will be time enough then to revise the analysis. At that time the value of the process itself, or of the patents representing it, can be placed on the books as an intangible asset.

In many balance sheets actual losses and other proprietary valuation items are grouped with prepaid services under the head “deferred debit items,” or a similar caption. This practice seems clearly improper. It should be recognized, however, that it is not possible to lay down hard and fast rules for distinguishing between these dissimilar facts which cover all cases. The nature of each deferred charge must be determined in view of the concrete circumstances giving rise to the charge. Certainly in analyzing a balance sheet all such items should be carefully scrutinized.

The nature and treatment of prepaid revenues should be briefly considered in this section. An illustration will perhaps serve to explain the significance of such a deferred credit. A water transportation company, whose boats ply to and from certain resort points, sells season ticket books during the month of May amounting to \$12,000. In this month tickets are taken up having an aggregate value of but \$5,000. Ignoring the question of selling expense it is evident that the company has *earned* during May but \$5,000, the amount of the cancelled tickets. The balance of the tickets sold represents a deferred revenue — a liability item of the nature of the prepaid rent balance discussed on page 180. The company is still obligated to furnish to certain individuals services with a selling price of \$7,000.

The entries covering these transactions — in summary form — would be somewhat as follows:

(1)

Cash . . . . .	\$12,000	
Sales of Tickets . . . . .		\$12,000

(2)

Sales of Tickets . . . . .	\$5,000	
May Revenue . . . . .		\$5,000

The balance of the Sales of Tickets account is a deferred revenue — a liability — and would appear as a deferred credit balance in the balance sheet prepared on May 31st. This balance is transferred to current revenue as the tickets which it represents are taken up.

Such an analysis of sales is not of great importance from the standpoint of the investors provided it is the annual statement of net revenue which is used as a basis for dividends and other appropriations. From the manager's standpoint, however, it is essential that total earnings be properly apportioned among the various operating periods.

Prepaid revenues are not as common in business practice as are revenues earned but unpaid. In many cases a company sells the finished goods in advance of completion, although payment is not made until delivery. Extreme instances of such contracts are found in such industries as shipbuilding. In these cases it is usually considered proper for the company to accrue a reasonable proportion of the total revenue in each period, even if no payment whatever has been made. In any case — as was emphasized in a preceding section of this chapter — it is seldom a rational procedure to follow cash transactions in determining current revenue.

Deferred revenue credits are sometimes grouped with asset valuation items on the right-hand side of the balance sheet. This practice is not a desirable one, as prepaid revenues and offsets to assets are in nowise congruous items.

#### WASTING ASSETS

Practically all kinds of assets expire in business operation, but many types of property are of such a character that they cannot be replaced concurrently with the expirations, if at all. Such properties are mines, forests, and other natural resources, and properties arising from terminable state or private grants such as patents, copyrights, franchises, leases, etc. Consider, for example, the case of a mine. Every pound of ore removed lessens the value of the property (assuming that there is no change in current costs or in the price of the product). A particular corporation may be able to acquire new property of a

similar nature, but frequently this is not possible. Then in such a case if revenue is retained in the business to cover the decline in capital assets, it must be retained in the form of cash or other liquid funds. It is common practice, however, to return the capital to the stockholders in the form of dividends as the property expires. In such a case the dividend amount should be carefully apportioned between net income and the return of the original investment. Otherwise, as is frequently the case, a serious misstatement of net revenue results. Often the stockholder considers his dividend check as representing pure income, and later, to his surprise, he discovers that his original investment has disappeared. It is imperative that if all property expirations are not included in the expense charges the residuum from the expense and revenue statement shall not be considered as net revenue, and that if this figure be paid as dividends it shall be carefully apportioned between net revenue and capital return. This analysis should be made on the financial records of both the corporation and the stockholder.

Although in some cases the nature and extent of the ore body may be estimated with reasonable accuracy from the results of preliminary drilling, in vein mines it is often exceedingly difficult to determine by exploration the size or character of the mineral deposits. In such cases it may be urged that it is not feasible to amortize the cost of the mine itself by charges against revenue. The venture is a highly speculative one; and the owners understand the risks. Accordingly no purpose is served by attempting to write down the capital assets. The size and character of the ore body are largely matters of guess; new deposits are being continually discovered; old veins are found to be faulted. Hence there is no rational basis for estimating such depreciation charges. Even in such cases, however, it would be a conservative policy to charge a reasonable allowance for expired capital against each year's revenues. Experience has demonstrated that such properties do not last indefinitely. In any case the depreciation of equipment — shaft, power-plant, etc. — should of course be regularly recognized by charges against revenue.

In some cases the physical expiration of assets in a wasting enterprise may be quite easily measured. A lumbering company, for example, may be organized for the specific purpose of

cutting the timber on a given tract. The value of the timber removed each year — on a cost basis — could be estimated with approximate accuracy. It might seem that this amount — in addition to running expenses — should be charged against gross sales each year if net revenue is to be correctly stated. The problem of interest is involved in the valuation of such a property, however, in much the same way as in the case of a regular annuity. Hence the “present value of future revenue method” is the most logical device for measuring the depreciation of such a terminable property. This and other methods of measuring depreciation will be discussed in Chapter XXIII.

Patents, copyrights, leases, etc., are similarly assets which cover definite periods and which should be depreciated in each case during the life of the asset by charges against revenue. All such rights and privileges expire in time and often cannot be replaced in kind. The amount of the expiration in each case must be treated as an expense and included among the current charges. If capital retained by such charges is returned to the stockholder, this fact should be recognized in the accounts. The accounting treatment of such intangibles will be further discussed in later chapters.

#### MAINTENANCE AND IMPROVEMENT

The problem of ascertaining whether a given expenditure represents a repair or a renewal (and hence is an expense charge), or whether it represents an improvement (and hence is a capital outlay), is often a serious one. Particularly in the case of complex properties such as railroads it is sometimes a very difficult matter to draw the line between maintenance and improvement. This problem has been rendered unnecessarily involved because of the common tendency among accountants and operating officials to confuse physical and value facts. When it is once clearly recognized that accounting is concerned primarily with the value representations of things, part of the difficulty disappears. It is not the physical object which appears in the accounts in any case, but rather the value of the object. In other words, the technical nature of a productive instrument has accounting significance only as it conditions the value of the instrument.

If a machine which cost \$5,000, for example, and has been carried on the books since the date of purchase at that figure, is replaced by another machine of like physical efficiency but which costs \$6,000, it would seem evident that \$1,000 of the new expenditure represents a capital outlay. It is true that no more physical product is produced by the new machine than by the old; but it is also true that the investment now necessary for the production of the particular product involved is \$6,000. To show this new figure in the financial records is simply tardy recognition of the fact that the capital cost of producing a certain commodity or service has increased. The proper journal entries covering the above transaction would therefore be: <sup>1</sup>

(1)			
Expense . . . . .		\$5,000	
Machine No. 1 . . . . .			\$5,000

(2)			
Machine No. 2 . . . . .		\$6,000	
Cash . . . . .			\$6,000

The accounts should always show the present value of the property being used by an enterprise in producing its product if statistics drawn from the accounts are to furnish the manager with the information which will enable him to make rational use of the economic resources at his disposal. According to this view the new machine mentioned above would be entered in the accounts at \$6,000 even if its physical efficiency were less than that of the old machine. Or if the new machine were of an improved type and cost less or more than the original machine, it should in any case be entered on the books at its cost new. The fact that ninety-pound rails are used to replace seventy-pound rails, for example, does not tell those interested whether the property is being maintained or whether an improvement is being made. The question is: what is the capital outlay necessary to make this replacement? If the new expenditure is greater than the cost of the old equipment, the difference represents an addition to capital; if the necessary expenditure

<sup>1</sup> These entries are made according to the "replacement policy" of handling depreciation. See Chapter XXII.

is less than the old cost, then the investment in the particular property item involved is less than before.

Even if it be decided to adopt the above position, there are in many cases practical difficulties in the way of determining just where to draw the line between repairs and replacements, and improvements or betterments. In connection with the upkeep of a complex piece of property, where there is no test of market price available, it may be almost impossible to determine accurately which outlays are actually expenses and which are capital charges. Repairs (so-called) to a factory building, for example, may be so extensive as actually to increase the value of the building, but it may be very hard to determine just what is the amount of the improvement. Arbitrary estimates and rules are necessary in such cases. Such estimates should, of course, be based on all available information in each particular case. Approximate accuracy is all that can be hoped for in most instances. The rules of the Interstate Commerce Commission in connection with the maintenance of steam railway properties, for example, formerly prescribed that no specific expenditures of less than \$200 should be considered as chargeable to additions and betterments. Under this ruling some small improvements were wrongly charged to expense; but it was expected that errors in the other direction would approximately offset any such charges.

In any industry in which improvements in mechanical technique are taking place very rapidly, and where it is the practice to charge all repairs and renewals in the technical sense to expense, overstatement of expense and understatement of capital is quite likely to result. This has been the situation in the case of many American railway properties. Old locomotives were scrapped and replaced with more efficient and *more costly* types, and the entire cost of the new equipment was considered as a replacement. Such a practice results in what are called *secret reserves*. Such a reserve is an item of proprietorship which represents profits retained in the business, but which does not appear on the balance sheet because the property is understated by just the amount of the reserve. This practice is entirely illegitimate. It may not mean as direct a step toward financial disaster as the opposite error — the overstatement of property and the

understatement of expense — but the individual stockholder is misled and often suffers from such a practice. Further, accounts which do not represent at least approximately the actual situation cannot serve the purposes of management for which financial statistics are intended. It should be observed that the practice of charging improvements to expense followed by some railroad companies in their early history did not in every case lead to the understatement of total assets; for in many cases the original property figures were much too large. In such a case an overstatement of expense means that profits are being retained in the business — although this is not recognized as such in the accounts — and are building up a previously overstated property; or, in other words, overcharges to expense are making good equities which have been only nominal up to this time.

It might be said at this point that it is the practice of many banking institutions to understate or to omit entirely from the accounts such assets as real estate and furniture and fixtures, and in this way to create secret reserves. While it is essential that a banking house be conservative in its accounting practices it is doubtful if such a procedure even in the case of banks is in any way justified. Sheer understatement where it is possible to ascertain the actual facts is not conservatism but concealment; and it hardly seems as if any proper purposes were served by such accounting. Certainly in some cases secret reserves have been built up by those in control for the express purpose of defrauding minority owners. Usually the interests of the various equities involved are best protected if all the assets — in as far as they can be ascertained — are shown in the accounts. If actual assets are charged against revenue, net revenue is not correctly stated, and erroneous conclusions will be drawn by the stockholders and others concerned. If assets are concealed by charges to surplus, the operating sheet may be correct, but an equity is misstated in the balance sheet; and again the situation is misleading to the individual owners.

Probably repairs and renewals are more often charged to property than are, improvements charged to expense. The desire on the part of the management in a particular case to make a good showing of net revenue is often responsible for



such a procedure. Frequently, however, this is done because an error is made in the analysis of expenditures. Expenditures which are made for the purpose of earning the revenue of a single fiscal period, and which represent no value at the end of that period, must be carefully distinguished from expenditures which mean a relatively permanent improvement. An amusement company, for example, furnishes a skating rink in the winter and a swimming pool in the summer with practically the same property equipment. Each seasonal change, however, requires some expenditures for reconstruction. These outlays, obviously, are not property charges, but represent current expenses. If these items were considered as improvements each season the value of the property would soon be seriously inflated.

From the standpoint of financial integrity the error of charging repairs and renewals to property is more serious than a practice which leads to secret reserves. Errors in either direction, however, are serious from the standpoint of proper accounting, and should be avoided as far as possible.

#### APPRECIATION AND DEPRECIATION

If the net revenue be defined very broadly as the net increase in the equities during a given period (allowing for new investment and capital withdrawals), it is clear that this figure can only be discovered when *all value changes* are taken into consideration. According to this conception of net revenue the accrued depreciation of fixed assets — as well as the expirations due to the consumption (or loss) of specific units of commodities and services — constitutes a part of the total expense for a given period. Similarly all appreciation of the durable equipment and other assets during an accounting period — as well as accruals from the sale of product — is a part of total revenue. Not until all these variations in asset values have been recognized can the new status of the equities be determined.

In so far as depreciation and appreciation are normal results of business operation within a given period such value changes may be reflected in the expense and gross revenue accounts. If these changes are unusual, however, or apply to several past accounting periods, the Net Revenue and Surplus accounts

may be used to show the necessary equity adjustments. Suppose, for example, that a manufacturing company has a building valued at \$10,000 destroyed by an unusual storm. The entries might be as follows:

Surplus . . . . .	\$10,000	
Buildings . . . . .		\$10,000

If this loss were considered as a current deduction from ownership the entries would be:

Net Revenue . . . . .	\$10,000	
Buildings . . . . .		\$10,000

Still another procedure would be to charge a special account such as "Storm Loss." If no net revenue or surplus balances were available this account might be carried as a deferred expense as explained in a preceding section.

In a sense items of appreciation are always *net* revenue credits, for no deductions are involved as in the case of ordinary revenues. Suppose a factory site, for example, appreciates to the amount of \$5,000 during an accounting period. The following entries would recognize this occurrence:

Real Estate . . . . .	\$5,000	
Net Revenue . . . . .		\$5,000

If such an item of appreciation covers several accounting periods before it is recognized in the accounts, it should be credited not to Net Revenue but to Surplus, thus:

Real Estate . . . . .	\$5,000	
Surplus . . . . .		\$5,000

For in this case crediting the amount of appreciation to Net Revenue would distort the current figure. In the meantime some of the individual owners may have retired from the enterprise without receiving their full rights in property, but this situation cannot, of course, be remedied. The most adequate procedure, then, is to make this adjustment through the surplus accounts.

If it seemed desirable to show the above mentioned item of

appreciation in distinct net revenue and property accounts, entries somewhat as follows would be made:

Appreciation of Real Estate . . . . .	\$5,000	
Net Revenue from Appreciation . . . . .		\$5,000

Where items of appreciation are large it is no doubt best to adopt this or a similar procedure; for by the use of such special accounts the nature of the transaction is definitely shown in the accounts. In any case, however, the explanation of the occurrence may be found in the details of the original journal entry.

It might be objected that the conception of net revenue here developed is improper in that it apparently obscures the results of actual operation by combining in one figure net operating revenue and accruals due to price changes.<sup>1</sup> This objection is not of great importance. As a matter of fact this analysis does not mean that no differentiation is possible in the financial records between the results of actual operation and the results of the speculative opportunities and burdens involved in a business enterprise. It is quite possible to organize the accounts and statements in such a way as to reveal both net revenue from operation, so-called, and total net revenue as well. In this connection it should be noted that the figure which the accountant considers as net operating revenue — the result of purchase and sale transactions, and ordinary accruals — is not, in most cases, restricted to the results of operation as distinct from the speculative and accidental possibilities. If a business enterprise purchases raw materials in a falling market and sells the finished product in a rising market actual appreciation is involved in the revenue from operation. This can be made clear by an illustration. Suppose that a wholesaler buys merchandise for \$100,000, and that before he sells again an advance in price occurs which would mean a price of \$120,000 for this same lot if he were buying now. The merchant will now be able to sell this lot for \$120,000 plus his customary

<sup>1</sup> In general accountants object to the recognition in the accounts of the appreciation of unsold assets, although the validity of depreciation as a matter of accounting record is admitted. This opinion is due in part to conservatism, and in part to a misunderstanding of the functions of accounting and the implications involved in valuations. In Chapter XX the general principles of valuation will be fully discussed.

advance, or, in other words, gross revenue is increased by \$20,000 due to appreciation. The amount of net revenue in such a case is not restricted simply to the results of operation in the narrow sense. Similarly, costs may be unusually heavy in a particular period due to accidents and unfavorable price changes. If such costs are treated as current expense — as is usually done — the net revenue figure will not indicate merely the results for which the manager and the other operating officials are directly responsible.

An ideal classification of expense and revenue accounts would undoubtedly be based on the principle that all charges and credits applicable to technical operation as such should be segregated in the "operating" accounts, and that all accruals due to speculative changes and ancillary operations should be shown in the "non-operating" accounts. This goal is far from realized in any system of accounts now in use, however; and in view of the complexities of the typical industrial situation it is doubtful if this ideal can ever be more than approximated. Indeed the notion of operation as a mere mechanical process can hardly be said to be justified as an accounting conception. Production is an economic process, and the speculative exigencies of business life are inextricably bound up with physical production. In some cases production consists entirely in the performance of services; and often it might be said that the taking of risk is an important part of the regular productive function. In such cases, certainly, it would seem reasonable to consider *all* value accruals as applicable to the regular expense and revenue accounts.

Emphasis has been laid in a preceding section upon the importance of preserving in the accounts and statements the integrity of the accounting period. In an important sense it might be said to be the function of accounting to present a classification of business transactions and accruals in terms of fiscal periods. In this connection the appreciation of assets — particularly current assets such as materials — has an important bearing. This can best be shown by means of an illustration. A retail merchant, it will be assumed, buys goods in October, 1917, amounting to \$25,000. The journal entries at the time of purchase would be:

Merchandise . . . . .	\$25,000	
Cash . . . . .		\$25,000

On December 31st the merchant closes his books and prepares statements. At that time the lot of merchandise purchased in October is still unsold, and it is discovered that it would now cost \$30,000 to replace this shipment. On the theory, however, that no revenue is yet *realized*, the appreciation of merchandise is not recognized in the accounts. During January, 1918, these goods are sold for \$40,000, an advance of \$5,000 over the price which would have been realized had there been no increase in wholesale prices. The entries — assuming cash sales — would now be as follows:

Cash . . . . .	\$40,000	
Sales . . . . .		\$40,000

These entries show that a gross revenue of \$40,000 is realized in 1918.

But do these entries show the actual situation? Is the 1918 management entirely responsible for this revenue? Or is it not true that a part of this revenue — \$5,000 — accrued in 1917 and should be credited to the revenue accounts for that year? At least there would seem to be some force to this contention. Had the appreciation of merchandise been recognized when the accounts were closed in 1917 the entries might have been as follows:

Merchandise . . . . .	\$5,000	
Revenue from Appreciation . . . . .		\$5,000

These entries would have served to allocate to the revenue accounts for 1917 the revenue actually realized in that year — realized in the form of added value in merchandise. The charge to Merchandise would serve to increase the cost of goods sold in 1918 by \$5,000, and hence would reduce the showing of revenue for that year — as far as this shipment of goods is concerned — by that amount.

This procedure should not be confused with the illegitimate practice of forecasting profits in the accounts. To forecast profit is to use *selling prices* in taking inventories. To accrue the revenue due to an increase in the *cost of replacing* materials

and similar assets is an entirely different matter. Whatever may be decided about the wisdom of recognizing appreciation in the accounts, it at least should be admitted that this is not the same thing as the anticipation of profit.

A word should be added in this connection concerning the wisdom or possibility of declaring dividends on the strength of a showing of net revenue which is due in part to appreciation of unsold assets. In general it may be said that dividends are based upon the net revenue figure rather than upon the cash balance, and that in any case net revenue is likely to be represented on the asset side by general assets rather than by cash alone. The current assets received when goods are sold may be shortly invested in additional material, supplies, machines, etc. In general appreciated assets form as solid a basis for credit and dividends as additional units. On the other hand it should be noted that even in the case of a net revenue figure based entirely upon sales the condition of the money market and other factors may make it unwise to declare dividends.

In this section it is intended merely to suggest the way in which asset valuations affect the net change in the status of the equities during a given period. The problems of valuation have many other accounting implications. In Part IV particular attention is given to these problems. The significance and treatment of appreciation will be more fully discussed in this connection.



**PART TWO**  
**THE EQUITY ACCOUNTS**





## XI

### PROPRIETORSHIP — SINGLE-PROPRIETORS' AND PARTNERS' ACCOUNTS

THE point has been emphasized repeatedly in the foregoing pages that the accounts of a business enterprise are kept primarily from the standpoint of the private equities involved. It is the private owners -- the interests that furnish the necessary capital -- who have control of business operation in any case. The net revenue figure -- the goal of the business struggle from the accounting standpoint -- measures the change in the status of these equities. Hence the accounts which represent the equities form in many ways the most important group of accounts. The results of the business process are reflected particularly in these accounts; the financial history of the enterprise can be read, in large measure, from these accounts. Several chapters will now be devoted to a discussion of the nature of the principal types of equities, and to an analysis of the typical transactions affecting the accounts with these interests. As already noted the laborer has a current equity in the business enterprise, but this equity is retired so frequently as seldom to assume important accounting significance. Similarly the state through its tax power may be said to have an equity in every enterprise; but the state's claim is also an equity which is currently retired. It is the equity accounts which represent the capital investment in any case which are of particular accounting importance; and in the following chapters it is these accounts which will receive especial attention. The present chapter begins a discussion of the most important equity from the accounting standpoint, the proprietorship interest, and is devoted primarily to an analysis of the proprietary accounts in single-proprietorships and partnerships.

#### PROPRIETORSHIP

The ownership of property, broadly understood, is a complex fact comprising several elements. The principal burdens as-

sumed by the investor in a business enterprise are: (1) the bearing of risk; (2) the taking of responsibility and control; (3) the furnishing of capital-service. (Sometimes the proprietor furnishes ordinary labor services as well.) These phases of ownership are more or less inseparable: for example, there can be no risk without the furnishing of capital; nevertheless these different elements may be subdivided and combined in a great variety of ways, as is evidenced by the specialization of securities in the modern business organization. The division of all equities into *proprietorship* and *liabilities* is based upon an important general classification of the burdens — and accompanying privileges — of ownership just mentioned.

The line drawn in accounting between proprietorship and outside equities or liabilities corresponds roughly to the distinction made in economics between the entrepreneur and the capitalist proper. The individual or interest that assumes the major element of risk in a business enterprise and takes the major share of final responsibility and control is the entrepreneur; the individual or interest that furnishes capital, but takes comparatively little risk and has but slight control of financial policies and business operation is the capitalist proper.<sup>1</sup> Similarly the equities which involve the large element of risk and control of operation form proprietorship; the other equities which carry less risk and less control are the outside equities or liabilities proper.

This general distinction may be expressed more concretely. All equities which have *contractual* rights to assets as either income or principal are liabilities; the equities which have *residual* rights to assets constitute proprietorship. In other words the proprietor's equity acts as a buffer for all other equities in the enterprise. All contractual accruals of income must be met before any proprietary income is available; all contractual rights in capital must be met in case of financial disaster, or liquidation for any reason, before the proprietor's claim may be considered. On the other hand whatever sum is available either as income or principal *after* other claims are satisfied is proprietorship. The proprietor assumes in large measure the burden of speculative losses; the proprietor realizes in large measure the benefit of speculative gains.

<sup>1</sup> Cf. Taylor, *Principles of Economics*.

On the accounting side the proprietary equity is of particular importance because the proprietor is in *control*. The proprietor — albeit there are certain important reservations in particular cases — has almost complete ultimate control of business operation and financial policies. The proprietor — or his manager — buys materials, hires laborers, decides as to processes, finds a market, extends credits, etc. Naturally the proprietor's interest tends to dominate accounting theories, methods and policies. This point of view, however, has been unduly stressed in the case of corporation accounting. The present tendency in corporation finance is toward the restriction of proprietary control in favor of the other important equities.<sup>1</sup>

The legal view which practically identifies the business organization with the proprietor's equity in many cases gives added accounting importance to proprietorship. A study of reorganizations in the case of large corporations, however, reveals the fact that the courts are now thinking of the business enterprise as a unit with a variety of equities, each of which has certain peculiar rights and privileges. It should also be observed that the legal view is not necessarily the proper standpoint for the accountant. The legal liability in the case of a promissory note, for example, is always the par or face of the note. The *accounting* liability at the outset is the amount actually realized. As the note matures it "accrues" to par.

There are other important general distinctions between proprietorship and liabilities. The proprietary equity is normally *perpetual* — or at least indefinite in length. A liability is generally *terminable*. Further, a firm does not become bankrupt if proprietary claims are not met; but if interest or principal is defaulted in the case of a typical liability legal insolvency is likely to ensue. These distinctions will be further considered in the following chapter.

In accounting practice proprietorship and the accounts representing this equity are quite definitely defined. In the pre-

<sup>1</sup> All general distinctions between proprietorship and liabilities must be stated with decided qualifications when applied to the most important type of business organization, the corporation. The difference between the proprietary equity and the liabilities is an important one but no hard and fast distinctions can be stated which apply in all cases. Corporate proprietorship will be discussed in the next chapter.

ceding chapters the important proprietary accounts have been frequently mentioned and briefly explained. It will now be necessary, however, to discuss more elaborately these accounts and the important types of transactions involved, especially from the standpoint of the leading types of business organization: (1) the single-proprietor enterprise; (2) the partnership; (3) the corporation. The difference between the accounting for one type of organization as compared with another lies primarily in the distinction between the equities and the equity accounts involved. The details of the various legal phases of the different types of organization will be introduced only when necessary for the explanation of the accounts and the transactions.

#### THE SINGLE-PROPRIETOR ENTERPRISE

The simplest form of proprietorship is found in the case where this equity is vested in a single person. Anyone who is producing for sale a commodity or service requiring for its production the outlay of capital might be called a proprietor.<sup>1</sup> If the person directing production, however, owns no capital in the enterprise, he is simply a manager or laborer selling his personal service.

It is in this form of organization that the distinction between proprietorship and liabilities can be most clearly drawn. The proprietor in such a case is usually spoken of as the "owner." The liabilities are said to represent the amount due to the "creditors" of the business. The "net worth" of the enterprise constitutes the proprietor's equity. The liabilities show the amount that he owes. The proprietor usually has almost entire control; and his equity is likely to represent from seventy-five to ninety-five per cent of the total investment. In all such cases it is easy to identify the proprietor with the enterprise itself, and to conceive of proprietorship as representing the actual ownership. This is a more narrow conception of ownership than the one given in the preceding section, however, and it is not an entirely satisfactory view even in the case of a single-proprietorship. For

<sup>1</sup> As was previously explained the business enterprise is conceived in this text as an establishment producing something for sale. Obviously accounting problems arise in connection with the ownership of consumption goods; and the owner of such goods might reasonably be considered a proprietor.

example, can it be legitimately said that a person *owns* outright mortgaged property? Is it not rather true that the proprietor in such a case shares with another the privileges and burdens of ownership? Certainly there are many cases in which the proprietor so-called is trading on a "shoestring." The proprietor in such a case is little more than the manager for the real owners. If absolute control is vested with such a proprietor the interests of the actual owners are jeopardized. The restriction of ultimate control to those who furnish at least a significant part of the capital is a healthy tendency in corporation finance. Even in the case of the single-proprietor business the view which looks upon all the equities as representing aspects of ownership is the more significant conception for the accountant to adopt.

If a business enterprise be defined in the broad sense suggested above it must be admitted that there are more single-proprietorships than of all other types of organization combined. But this does not mean that this type of enterprise is the most important for the accountant.<sup>1</sup> The newsboy on the street corner might be thought of as a proprietor; but his business is so small that he has little need for records of any kind as all the details of his business, financial and otherwise, can be readily kept in mind. The great majority of typical single-proprietorships, however, are of sufficient consequence to require accounting records.

In practice many such enterprises do not use the complete double-entry method. Quite commonly a small concern will keep a set of books which contain accounts with properties and liabilities, but which omit the proprietary accounts. There are few firms, however, which require accounts of any kind that might not advantageously make use of the complete double-entry system. In most cases this system will prove far simpler in the long run than any possible abbreviation.

A concrete illustration will serve as a convenient basis for the discussion of the proprietary accounts and the transactions affecting such accounts in the case of a business where proprietorship resides in a single individual. It will be assumed that A

<sup>1</sup> In point of aggregate capital controlled, number of employees, units of output, financial influence, etc., the corporation leads in many important lines of industry. In the case of the corporation the importance of proper accounting for the equities is greatly magnified.

is a small manufacturer; and that the following statement represents the financial status of his business on July 1st, 1918:

ASSETS		EQUITIES	
Real Estate . . . . .	\$ 7,500	A, Capital . . . . .	\$33,000
Machinery . . . . .	8,700	Mortgage . . . . .	8,500
Tools and Supplies . . .	5,600	Notes Payable . . . . .	2,300
Finished Product . . . .	5,000	Accounts Payable . . . .	6,400
Materials . . . . .	11,900		
Cash . . . . .	6,100		
Accounts Receivable . . .	4,200		
Coal . . . . .	500		
Insurance Prepaid . . . .	700		
	<u>\$50,200</u>		<u>\$50,200</u>

The account entitled A, Capital represents proprietorship in this statement. Other terms might be used for the main proprietary account such as A, Proprietor or, simply, Proprietor. The name of the proprietor without any accompanying explanatory phrase is frequently employed to designate this account.

The expense and revenue statement at the end of the month of July, it will be assumed, is as follows (in account form):

EXPENSE		REVENUE	
Labor . . . . .	\$1,200	Sales . . . . .	\$6,600
Depreciation Expense . .	150		
Materials Consumed . . .	3,500		
Fuel Expense . . . . .	300		
Insurance Expired . . . .	100		
Uncollectible Accounts . .	50		
Miscellaneous . . . . .	200		
Decrease in Inventories .	500		
	<u>\$6,000</u>		
Net Revenue . . . . .	600		
	<u>\$6,600</u>		<u>\$6,600</u>

The following represents the net revenue statement at this time:

NET REVENUE			
Interest . . . . .	\$100	From Expense and Revenue	\$600
Proprietary Net Income .	500		
	<u>\$600</u>		<u>\$600</u>

The balance of this statement, \$500, constitutes the increase in proprietorship, or the increase in A's equity. The journal entries (assuming a Net Revenue account is used) which transfer this item to A, Capital would be:

Net Revenue . . . . .	\$500	
A, Capital . . . . .		\$500

If now A decided to withdraw this profit the entries would be as follows:

A, Capital . . . . .	\$500	
Cash . . . . .		\$500

The first pair of entries simply transfer the item of proprietary net income from an allocation account to the proprietor's regular account and therefore merely represent a transposition of equities. The second pair of entries recognize the withdrawal of cash and an equal decline in proprietorship as stated.

Frequently such an account as A, Capital is used to show only the permanent investment that it is expected will be left in the business. This account in such a case is credited with the amount of all investments and is charged with all retirements of original capital. Another account is then introduced called (for example) A, Drawing, which is credited with all items of income and debited with all withdrawals of income from the business.

In accounting practice an allocation account such as Net Revenue is seldom used in the case of a single-proprietorship. Items of interest and proprietary income, together with all expenses, are charged to a summary account, Profit and Loss. In the case of a simple business this procedure may be considered expedient, but such confusion of unlike classes, as was emphasized in a preceding chapter, should be avoided as a rule. There are few cases in which a clear-cut division in the accounts of gross and net revenue charges and credits is not advisable.

In the case of actual losses and extraordinary gains entries might be made directly in the main proprietary accounts to reflect such happenings. Suppose, for example, that a storm damages A's building (referring to above illustration) to the extent of \$1,500. This occurrence would be journalized as follows:

A, Capital . . . . .	\$1,500	
Real Estate . . . . .		\$1,500



Similarly an extraordinary gain would require a credit to A, Capital. A customer's account amounting to \$500, for example, which has been considered worthless and has been written from the books, is paid in full. The entries would be :

Cash . . . . .	\$500	
A, Capital . . . . .		\$500

In case the proprietor allows himself a salary as an expense (see page 224) in order that net income may be restricted to a return to capital as such, but does not withdraw the sum allowed, it is necessary to credit a proprietary account for the amount of the expense charge. Suppose A, for example, allows a salary of \$150 per month for his own services, but makes no immediate withdrawal of this amount. The entries would be :

A's Salary . . . . .	\$150	
A, Drawing . . . . .		\$150

If A decides to leave this amount in the business permanently as investment the item may be transferred to A, Capital, thus :

A, Drawing . . . . .	\$150	
A, Capital . . . . .		\$150

These entries have exactly the same final effect upon the accounts as would be the case if A withdrew the amount of his salary in cash and immediately reinvested the same amount. The entries in this event would be :

(1)		
A's Salary . . . . .	\$150	
Cash . . . . .		\$150
and,		
(2)		
Cash . . . . .	\$150	
A, Capital . . . . .		\$150

This discussion shows the simplicity of the proprietary accounts and the transactions affecting these accounts in the case of a single-proprietor enterprise. The need for keeping accounts with proprietorship in such cases is not as great as in enterprises having a more complex form of organization. If accounts are kept with all asset items and with all liabilities, proprietorship — the difference between assets and liabilities — can be readily

ascertained from these accounts provided the other items are correctly exhibited. This is an indirect method, but might be feasible in the case of a very simple business. In such a case, however, the advantage of the complete double-entry method in furnishing a test for numerical accuracy would be lost. Further, unless subsidiary equity accounts (or at least a general expense and revenue account) were kept, there would be little information in the records concerning the process whereby the changes in the proprietor's equity had been brought about. The various "single-entry" and incomplete systems in use by so many firms are not to be commended.

#### COPARTNERSHIP PROPRIETARY ACCOUNTS

A partnership, or copartnership, is an association by contract of two or more persons who have combined their capital and skill in a business venture for the purpose of joint profit. The partnership agreement or contract may be either written or oral — aside from special statutes to the contrary; but as a matter of business expediency carefully constructed articles of copartnership should always be prepared which state in detail the relations of the partners in regard to investments, division of income, participation in management, drawings, rights at dissolution, etc. It is even desirable to have the contract go so far as to specify the accounting methods which shall be used; and detail directions relating to methods of production and other questions of management may well be stated in writing. At least authority to settle such matters should be specifically delegated; otherwise there are certain to be endless disputes and consequent inefficiency. The accountant's work in connection with partnerships is very much simplified if the articles of agreement give definite instructions concerning the important contingencies which may arise. A carefully stated contract minimizes the possibility of legal disputes and obviates, in large measure, the need for special audits.

Certain general peculiarities of the firm <sup>1</sup> or partnership should

<sup>1</sup> The term *firm* is usually restricted in law to the partnership. An established single-proprietorship making use of a firm name, however, may also be called a firm or "house" with propriety.

be mentioned. The ordinary partnership, unless formed for a specified time, is a partnership "at will," and may be dissolved at any time by any partner. That is, a partner may usually withdraw at any time even against the wishes of his associates, and by such a withdrawal the firm is thereby dissolved. This is an important general characteristic of the partnership as compared with the corporation. Further, every member of an ordinary partnership is liable to the entire amount of his private estate for the debts and engagements of the firm. In other words a partner risks not only the loss of his entire investment in the firm but the loss of any other property he may own should the partnership become insolvent (and its liabilities exceed its assets). This fact of "unlimited liability" accounts in some measure for the inadequacy of the partnership form to meet the needs of large scale production. Where a large aggregate of capital is needed it would usually be very difficult to induce a sufficient number of investors to combine their interests on this basis.

There may, of course, be any number of partners, although in actual business there are very few partnerships with more than four or five members. The several partners may be associated on an equality as regards investments, management, drawings, etc.; but very commonly there are differences in the rights of the partners in one or more of these respects. The law recognizes several kinds of partners with which the accountant should be familiar. A "silent" or dormant partner is one who takes little if any active part in the transaction or control of the partnership business. A "secret" partner is one who is not known as a partner, although he may be active in the management of the affairs of the firm. A "nominal" partner is not a partner by contract or agreement, but may be considered a partner legally if he has knowingly permitted himself to be "held out" as a partner to the public.

The "limited" partnership and the joint stock association are special types of partnerships. Limited partnerships are authorized by statutes in most of our states. In such firms the liability of certain members called "special" partners is limited to the amount of capital contributed in any case. Other members, called "general" partners, are liable to the creditors — or outside equities — for all the obligations of the firm as in

the ordinary partnership. The joint stock association is usually nothing more than a large partnership having transferable shares which represent the partners' equities. The unlimited liability feature pertains to such companies as in the case of regular partnerships. In this country the joint stock company is not at present a popular form of organization, and has almost entirely given way to the corporation.

In a partnership the equities of the partners constitute proprietorship. The partners' accounts are the proprietary accounts. All other equities represent the liabilities of the firm. In the absence of special agreement to the contrary the assets of the partnership are joint property. No specific asset belongs exclusively to any partner. A partner's interest is simply a right to share in the general assets of the firm after all liabilities have been met.

Although the law makes a rather sharp distinction between the equities of the partners and the liabilities or debts of the firm it is important that the accountant keep in mind a conception of the firm as an entity. The balance sheet of a partnership is prepared in the same way as the balance sheet of a corporation — all assets on one side, all equities on the other. The balance sheet is the groundwork of partnership accounting as it is of single-proprietorship or corporation accounting. Hence the various transactions occurring should be viewed from the standpoint of the enterprise as a whole rather than in terms of the partners' equities alone. An individual partner, for example, may borrow from or loan to the firm in much the same manner as an outsider. This is one illustration of the type of situation arising which requires the accountant to think of the entire enterprise as a unit.

In the partnership the proprietary accounts are more numerous than in a single-proprietor enterprise, and some complexities arise. For an illustration it will be assumed that in the balance sheet shown in the preceding section proprietorship is represented by the capital accounts of two equal partners, A and B, instead of the single proprietary account. The expense and revenue statement at the end of one month will be assumed to be the same as for the single-proprietorship. Hence, as far as expense and revenue and other subsidiary equity accounts are

concerned, there would be exactly the same records required for the partnership as in the simpler organization. The entries closing the item of net income into the proprietary accounts would differ only in that more accounts would be involved, thus :

Net Revenue . . . . .	\$500	
A, Capital . . . . .		\$250
B, Capital . . . . .		250

In distributing profits or making other withdrawals the partner's capital account is debited and Cash is credited as in the case of the single-proprietorship. The other types of proprietary transactions illustrated in the preceding section would be handled in the same manner on the books of the equal partnership except that two proprietors would be involved instead of one.

There is likely to be little regularity about the distribution of income, or withdrawals of investment, by the partners unless there is specific stipulation in regard to this point in the articles of agreement. This is one reason why the capital accounts of partners frequently show such disproportionate balances. Usually the investments at the outset are equal or represent simple fractions of total proprietorship, but the irregularity of withdrawals may soon disturb this relation. Such a situation often makes the computation of a partner's share in income, or in assets at dissolution, somewhat cumbersome. Drawing or "personal" accounts are especially useful in the case of a partnership to show current increases and decreases in the partners' equities.

When income is not divided among the partners in proportion to investments, interest may be allowed on each partner's equity, and then a distribution of the residual income made. A variation of the above case will serve as an illustration. Suppose that of the partners mentioned A is the only one actively interested in the business, while B is a silent partner, investing capital and assuming risk but taking only slight interest in actual management. The articles of copartnership, it may be assumed, stipulate that after each partner is allowed six per cent on his investment the balance of the income is to be divided, two-thirds to A and one-third to B. In this case the situation may be shown on the books by making two distinct distributions of income among

the partners. The entries (using drawing accounts) would be somewhat as follows :

(1)		
Net Revenue . . . . .	\$165	
A, Drawing . . . . .		\$82.50
B, Drawing . . . . .		82.50

which credits each partner with one month's interest on \$16,500 at six per cent ; and,

(2)		
Net Revenue . . . . .	\$335	
A, Drawing . . . . .		\$223.33
B, Drawing . . . . .		111.67

which distributes the balance of net income, two-thirds to A and one-third to B.

In computing total proprietorship in the case of a partnership any credit balances in the drawing accounts must be added to investment as shown by the capital accounts. For even if such accounts show equity balances that are to be withdrawn, as long as such items remain in the business they form a part of total proprietorship. The equity of an individual partner would be similarly determined. In winding up the affairs of a partnership, however, the drawing account balances would not always be settled on the same basis as the capital account balances. The articles of agreement may require, for example, a division of the assets between partners in proportion to original investments. If such an agreement obtains provision should also be made to insure the maintenance of each partner's equity, at least approximately. Otherwise serious disputes concerning the distribution of assets at time of dissolution are likely to arise.

The need for an adequate system of proprietary and subsidiary accounts in the case of the partnership is evidently imperative. The amount of each partner's original investment may appear in the articles, but these amounts soon become obscured by withdrawals and accretions. Wherever proprietorship resides in more than one individual it is essential that careful accounting methods be observed. In such cases there is always a possible clash of interests, and the equity of one or more of the firm members may be jeopardized if complete proprietary accounts are

not kept. This matter is of still greater importance in the case of the corporation, where in addition to numerous individual owners may be found different *classes* of proprietors and other investors.

Many special legal and accounting problems arise in connection with the relations between partners as regards interest charges, loans, distribution of assets, etc. Some simple illustrations will be considered in the following section.

#### SPECIAL PROBLEMS IN PARTNERSHIP ACCOUNTING

In certain cases questions arise as to the correct presentation of the partners' accounts at the time of organization. The transition from a single-proprietorship to a partnership will serve as an illustration. A, it will be assumed, is a proprietor engaged in the retail trade. The balance sheet of his business, in summary form, appears as follows :

Assets (at book value)	\$40,000	A, Capital	\$40,000
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A now agrees with B to form a partnership. No new assets are contributed to the business, but B pays A personally \$15,000 for a half-interest in the enterprise. Since A and B are now equal partners the proprietary accounts should show equal balances. The following balance sheet would be consistent with this situation :

Assets	\$40,000	A, Capital	\$20,000
		B, Capital	20,000
	<u>\$40,000</u>		<u>\$40,000</u>

If the price which B pays for an equity, however, be considered as a reasonable criterion of the value of the assets of the business, it is evident that the book value of these assets is overstated by \$10,000. If certain of these assets, merchandise, for example, were written down by this amount the first balance sheet would appear as follows :

Assets	\$30,000	A, Capital	\$15,000
		B, Capital	15,000
	<u>\$30,000</u>		<u>\$30,000</u>

A somewhat different situation arises if it be assumed that B purchases an equal interest with A by *contributing* to the business cash to the amount of \$50,000. If the old assets be considered as worth \$40,000, the first partnership balance sheet would appear as follows :

Sundry Assets . . . . .	\$40,000	A, Capital . . . . .	\$45,000
Cash . . . . .	<u>50,000</u>	B, Capital . . . . .	<u>45,000</u>
	<u>\$90,000</u>		<u>\$90,000</u>

It might be assumed that the premium which B pays for his equity in this case is due to goodwill, an intangible asset belonging to the original business but not appearing in the accounts. A more reasonable procedure, according to this assumption, would be to set up the assets and partners' accounts as shown in the following balance sheet :

Sundry Assets . . . . .	\$40,000	A, Capital . . . . .	\$50,000
Goodwill . . . . .	10,000	B, Capital . . . . .	50,000
Cash . . . . .	<u>50,000</u>		
	<u>\$100,000</u>		<u>\$100,000</u>

It is evident from the foregoing simple illustrations that the original investment of a partner, as shown by his capital account, may not coincide with the actual amount contributed. In other words the purchase price of a definite fraction of the proprietary interest may not be consistent with the asset values as stated. This is particularly likely to be the case where one partner, with the consent of the other members of the firm, sells a part or all of his equity to an outside party who brings in no new capital. As long as the proper proportions are maintained in the partners' accounts, however, a revision of the asset values is not an imperative matter. The purchase and sale price of a share in proprietorship in the case of a partnership is little more likely to indicate the actual value of the firm's assets than is the price of a share of stock in the case of a corporation a reliable index at all times of the value of the corporation's assets.

As stated in the preceding section a partner may have debtor and creditor relations with the firm as an outsider as well as in the capacity of a proprietor. A partner may loan funds to the firm or borrow from the firm. Such transactions should be kept



carefully distinct from the regular proprietary transactions. The rights of the partner as an outsider have a different legal status in the event of dissolution as compared with his rights as a proprietor. Further, since the division of profits is often based directly upon the proportions which the amounts appearing in the individual proprietary accounts respectively bear to total proprietorship, it is essential that actual proprietary transactions be segregated.

Suppose, for example, that A, a partner, loans \$5,000 to the firm on the firm's promissory note (of which A himself may be a signer). This sum should be credited to Notes Payable rather than to A, Capital. Similarly if A borrows \$5,000 in cash from the firm on his personal note the transaction would be viewed as an exchange of assets and not a subtraction from A's investment. The entries in this case would be:

Notes Receivable . . . . .	\$5,000	
Cash . . . . .		\$5,000

It should be observed that in certain extreme cases rather artificial accounting situations may arise if there is a strict adherence to the distinction between transactions with the partners as outside individuals and transactions with the partners as proprietors. The following balance sheet illustrates such a situation:

Loans to A . . . . .	\$20,000	A, Capital . . . . .	\$20,000
Loans to B . . . . .	20,000	B, Capital . . . . .	20,000
	<u>\$40,000</u>		<u>\$40,000</u>

Obviously the partnership whose condition is represented by this statement has virtually ceased to exist as a business enterprise. It really has no assets and no equities. The loans to partners are essentially withdrawals of proprietary investment. The business has been liquidated. Although this statement represents a very unlikely situation, it serves to suggest a certain aspect of these internal relationships. The entity of the business enterprise should not be insisted upon too rigidly. One must be careful not to allow formal accounting entries to obscure the realities of a situation.

Similarly in connection with interest on loans to partners

peculiar situations may appear. Suppose, for example, that A, a partner, has borrowed \$5,000 from the firm on a six per cent note. At the end of a year it is agreed among the partners that the amount of interest due on A's note, \$300, shall be charged to A's proprietary account since A is not in a position to make a cash payment. The entries recognizing this transaction would be:

A, Capital . . . . .	\$300	
Interest . . . . .		\$300

The credit to Interest is apparently a revenue item, and it would in practice be handled in the accounts as would any interest revenue. It should be recognized, however, that this item is not actual revenue, but should be used to adjust original proprietorship between the partners. This may be made clear by an examination of supposititious balance sheets as affected by this single transaction. The balance sheet at the time the loan is made, it will be assumed, appears as follows:

Sundry Assets . . . . .	\$25,000	A, Capital . . . . .	\$15,000
A's Note . . . . .	5,000	B, Capital . . . . .	15,000
	<u>\$30,000</u>		<u>\$30,000</u>

Assuming that the partners share in all income in proportion to their capital account balances — or equally in this case — the interest revenue shown in the above entry would be distributed between the partners by the following entries:

Interest . . . . .	\$300	
A, Capital . . . . .		\$150
B, Capital . . . . .		150

The net result of this transaction, therefore, is a decrease in A's equity of \$150 and an increase in B's ownership of the same amount. The resulting balance sheet would show the following condition:

Sundry Assets . . . . .	\$25,000	A, Capital . . . . .	\$14,850
A's Note . . . . .	5,000	B, Capital . . . . .	15,150
	<u>\$30,000</u>		<u>\$30,000</u>

There has been no increase in total assets or in total equities. Obviously, therefore, no revenue has been realized. This il-

illustrates the importance of keeping out of the ordinary interest accounts interest transactions which result simply in adjustments between partners. If such interest debits and credits are included in one account with ordinary interest entries erroneous conclusions are likely to be drawn. An appropriate procedure in the above case, for example, would be to omit the entries in the Interest account. In this event the transaction would be journalized as follows:

(1)

A, Capital . . . . .	\$300	
A, Capital . . . . .		\$150
B, Capital . . . . .		150

or, simply,

(2)

A, Capital . . . . .	\$1	
B, Capital . . . . .		\$ \$150

In some cases the articles of agreement specify that interest shall be charged on deficiencies and credited on excesses as shown by the partners' capital accounts. In other words if a particular partner's drawings are excessive and reduce his equity below the original capital contribution, his capital account may be charged with interest at a specified rate on the amount of the deficiency; and if another partner allows his equity to accumulate above the stipulated investment his capital account may be credited with interest on the amount of the excess. Such items of interest are likewise adjustments in proprietorship between partners, and neither represent deductions from net revenue nor actual additions to revenue earned as the case may be. It is sometimes said that such items should be carried to the ordinary interest account and should be treated as interest on regular loans. This fallacious opinion is due to a too rigid emphasis upon the distinction between the partner as an outsider and as a proprietor.

As was explained in the preceding section the computation of interest on the partners' equities is sometimes required by the particular provisions in the agreement concerning the distribution of net income. In such a case residual income (after in-

terest allowances are distributed) is usually divided upon some other basis. Such agreements are common in cases where the functions of the several partners are quite different. A managing "junior" partner, for example, who invests very little capital, may be entitled according to the partnership contract to a liberal percentage of residual profits after the other partners have been allowed a certain rate upon their investments. Such a partner is essentially a manager, and the profit he receives is really the wages of management. Sometimes the more active partner is allowed a definite salary before any distribution of profit is made. Such a salary is a part of the earnings of the partnership, as a business unit, and if charged to expense simply restricts the stated net proprietary income to a return on capital (pure interest and profit). As was stated in a preceding chapter, however, such charges may be considered legitimate revenue deductions when for tax purposes the net income of the partnership is assessed on the same basis as the net income of a corporation which buys the services of management from outsiders.

Where interest adjustments are involved the distribution of proprietary income may require rather cumbersome calculations. A further example will serve to suggest the nature of such computations, and to illustrate certain other complexities which may arise. Suppose that A and B form a partnership, January 1st, each investing \$12,000. According to the agreement income is to be divided equally. On February 1st it is decided to take in another partner, C, who invests \$6,000. The articles of copartnership are amended in such a way as to require that the account of each partner be credited at the close of the current year with interest at a six per cent rate on his *net* investment from February 1st to the end of the year. The agreement stipulates that all residual income shall be divided in proportion to the actual equities of the partners as they appear on the books at the end of the year, before any distribution of income has been made. It is further agreed that the income for the month of January shall be considered as one-twelfth of the total for the year, and is to be divided equally between A and B according to the terms of the original contract.

During the year B's drawings are as follows: May 1st, \$350; August 15th, \$450; December 1st, \$200. A and C make no

withdrawals whatever. On December 31st, accordingly, the partners' equities stand on the books as follows: A, \$12,000; B, \$11,000; C, \$6,000. Net proprietary income, it will be assumed, amounts to \$3,600. The first step in distributing this amount according to the above stipulations is to divide one-twelfth of the total equally between A and B. The entries would be as follows:

Net Revenue . . . . .	\$300	
A, Capital . . . . .		\$150
B, Capital . . . . .		150

Interest must now be computed at six per cent on each partner's net investment for eleven months. The equities of A and C have remained unchanged at \$12,000 and \$6,000, respectively. The interest on \$12,000 for eleven months is \$660, and on \$6,000 for the same period, \$330. B, however, has withdrawn \$1,000 at various times. A convenient way to compute the interest allowance of this partner is to subtract from \$660 — the amount of interest had his investment remained unchanged from February 1st — the interest on \$350 for eight months (from May 1st to December 31st) plus the interest on \$450 for four and one-half months plus the interest on \$200 for one month. This computation gives \$635.88, B's interest allowance. The entries recognizing these allowances would be as follows:

Net Revenue . . . . .	\$1,625.88	
A, Capital . . . . .		\$660.00
B, Capital . . . . .		635.88
C, Capital . . . . .		330.00

The balance of the net income, \$1,674.12, is to be distributed in proportion to the partners' equities as they appear on the books before any income distributions are made. This sum will then be divided as follows: twelve twenty-ninths to A; eleven twenty-ninths to B; and six twenty-ninths to C. The entries recognizing this residual income distribution would be:

Net Revenue . . . . .	\$1,674.12	
A, Capital . . . . .		\$692.74
B, Capital . . . . .		635.01
C, Capital . . . . .		346.37

The partnership balance sheet, it may be assumed, now appears as follows :

Sundry Assets . . . .	\$32,600	A, Capital . . . .	\$13,502.74
		B, Capital . . . .	12,420.89
		C, Capital . . . .	6,676.37
	<u>\$32,600</u>		<u>\$32,600.00</u>

Although the above case illustrates a purely hypothetical situation, it should be recognized that a great variety of agreements and arrangements are found in partnership contracts; and where the partners' account balances are irregular some rather elaborate calculations may be necessary in distributing income.

As was implied in the preceding section any change in the personnel of a partnership virtually causes the dissolution of the firm. Where a partner voluntarily retires and sells his interest the change may not mean an actual liquidation of the business. Such a change from the accounting standpoint may be largely of nominal significance. But in the case of bankruptcy, or dissolution by court decree for other reason, the firm as a business enterprise usually ceases to exist. In such a case the assets are applied first to the payment of the liabilities, and any balance is then available for distribution among the partners. Any advances made by a partner to the firm must be met before the capital shares are distributed.

Unless the articles contain specific provisions in regard to dissolution some question may arise as to how the residual assets should be divided in certain cases. Should the proportions shown by the original capital contributions of the partners be used, or should the distribution be based upon the balances finally appearing in the partners' accounts? The partnership agreement should cover this point. In some cases the articles specify that losses shall be borne equally by all partners, although the investments are unequal and some other basis is used in distributing income. As an illustration of a dissolution on this basis it will be convenient to refer to the case discussed above. Suppose that after three years it is decided to dissolve the partnership because of serious losses and poor business prospects. The balance sheet at this time, it will be assumed, stands as follows :

Sundry Assets . . . . .	\$21,000	A, Capital . . . . .	\$12,000
Deficit . . . . .	9,000	B, Capital . . . . .	12,000
		C, Capital . . . . .	6,000
	<u>\$30,000</u>		<u>\$30,000</u>

Suppose further that the agreement provides that all losses are to be borne equally. The account of each partner, then, would be charged with one-third of \$9,000, or \$3,000. The entries would be:

A, Capital . . . . .	\$3,000
B, Capital . . . . .	3,000
C, Capital . . . . .	3,000
Deficit . . . . .	\$9,000

The resulting balance sheet would now show the following condition:

Sundry Assets . . . . .	\$21,000	A, Capital . . . . .	\$ 9,000
		B, Capital . . . . .	9,000
		C, Capital . . . . .	3,000
	<u>\$21,000</u>		<u>\$21,000</u>

The assets may now be distributed according to the amounts appearing in the partners' accounts.

The transition from the partnership to the corporate form of organization is often a complex accounting transaction. This situation will be discussed in the following chapter on corporate proprietorship.

## XII

### CORPORATE PROPRIETORSHIP — CAPITAL STOCK

It has been noted several times in the preceding chapters that the corporation is the most important form of business organization with which the accountant has to deal. The large scale enterprise which may be said to be typical of modern industry is usually organized under the corporate form, and it is in connection with the complex equipment of such large enterprises that the more difficult problems of valuation arise. Further, a correct periodic presentation of the status of the rights of ownership is a matter of particular importance in the case of the corporation because of the large number of individual investors involved in the typical case, and also because of the different *classes* of equities represented. The detachment of the investor from the immediate management of the affairs of the corporation, and the transient character of many of the individual owners, are other factors contributing to the need for adequate corporation accounting. In this chapter and the next the nature of corporate proprietorship and proprietary accounts will be discussed. In the present chapter typical transactions affecting Capital Stock and related accounts will be explained. Some attention will be given to the peculiar features of the corporate form of organization, and to the special books and records required. Chapter XIII will be devoted to a discussion of the surplus accounts.

#### CORPORATE PROPRIETORSHIP

The private business corporation (to which the discussion in this text will be largely confined) is like the partnership an association of persons formed primarily for the pecuniary profit of its members. The corporation, however, differs from the partner-



ship in several marked respects. Whether created by special act or charter or by general law the corporation is endowed by the state or government with the power of acting in many respects as a single individual. In fact, from a legal point of view, the corporation is an artificial being possessing an existence separate and distinct from that of its individual members. The universal recognition by the courts of the reality of this corporate entity is a matter of very considerable importance. It means that a corporation, having a legal existence distinct from that of its members, is not dissolved by changes in the personnel of its membership, as is the partnership, due to the death or withdrawal of individual members and the substitution of others. The entire membership of a corporation might be changed any number of times and still the legal existence of the organization would not be disturbed. It follows that the legal title to the corporate property resides in the corporation itself, and not in its members as individuals, either separately or collectively. In general, moreover, the liabilities incurred and the engagements made in the corporate name are the obligations of the corporation alone, and bind only its assets or property and not the assets of individual members,<sup>1</sup> while in the case of the partnership — as was explained in the preceding chapter — the law regards the relation of the members as a purely contractual one, and each partner is held personally responsible for all of the liabilities and contracts of the partnership. This fact of limited liability is one of the chief advantages of the corporate form as a means of attracting the capital of the investor.

A corporation is most commonly incorporated under a general law authorizing such organizations. The original promoters and other parties interested meet and agree upon a plan of action. Usually at this first meeting a part of the authorized capital stock is subscribed for, and an organization is effected by the election of a board of directors and other officers. Articles of association are then prepared and the other necessary legal steps to initiate the enterprise are taken.

<sup>1</sup> In certain special cases there are exceptions to the rule that a corporate member is liable only for the amount of his investment. The stockholders of national banking companies are liable for twice the par value of their stock. Some states also have laws restricting the limited liability privilege in general.

The members of the ordinary stock corporation are the stockholders, and it is the equity of the stockholders which constitutes corporate proprietorship. It is therefore the proprietary equity in the corporation as well as in other types of organization which, in law, represents ownership *par excellence*. The authorized capital stock is the amount fixed by the charter or articles of incorporation as a basis for the contributions of the stockholders. The total capital stock is divided into aliquot parts called shares. The equity of each stockholder is evidenced by the number of shares he holds. A share of stock, as was implied above, does not constitute a title to any specific asset of the corporation, but it represents a certain fraction of total proprietorship, and thus carries with it certain rights in management, income, and *ultimate* assets.

The number of shares which each stockholder has in the corporation is represented by a stock certificate, signed by the proper officers of the company. The nature of such a certificate is suggested by the following illustration.

#### INTERNATIONAL STEEL COMPANY

NUMBER  
1120

SHARES  
100

This certifies that A. W. Rollins is the owner of one hundred shares (par value ten dollars) of the capital stock of the

#### INTERNATIONAL STEEL COMPANY

a corporation duly organized under the laws of the state of Delaware. This stock is transferable on the books of the Company only in person or by attorney, upon the return of this certificate properly endorsed.

*In Witness Whereof*, the said company has caused this certificate to be signed by its President and Secretary, and its corporate seal to be affixed, at the office of the company at Wilmington, Delaware, this 15th day of August, 1918.

JAMES B. HARLEY, *President*.

(SEAL)

S. R. WILSON, *Secretary-Treasurer*

FULLY PAID AND NON-ASSESSABLE

The legal holder of such a certificate is one of the corporate proprietors. Such a certificate may be acquired either by means of a contract entered into directly with the corporation or by

purchasing or otherwise securing the equity of someone previously a shareholder.

The stockholders as a rule are not active in the management of the corporation, while the proprietors in partnerships and single-proprietorships usually are. The ultimate authority resides in the stockholders but active management is vested in a board of directors elected by the stockholders in a manner prescribed by law. The directors are usually shareholders, but not always large shareholders. A set of rules or by-laws approved by the stockholders governs in a general way the conduct of the corporation's business.

Thus far in the discussion of corporate organization and proprietorship it has been assumed that the membership of a corporation is a congruous body of stockholders; or, in other words, corporate ownership has been identified with corporate proprietorship — the stockholder's equity. This is essentially the legal view; but there are certain important developments in corporation finance which make it essential that the accountant conceive of the corporation as a business enterprise on a somewhat broader basis. In the first place there may be more than one kind of capital stock. The most important general distinction is between *common* and *preferred* stocks. This distinction simply carries one step further the important division of the elements of ownership explained at the beginning of the preceding chapter. The common stock represents the more speculative phase of proprietorship, carrying more risk and frequently greater control. In some cases the common stock is given as a bonus with preferred stock or bonds, and in such a case its value is purely speculative.

The preferred stock may be preferred either as to income or as to capital in case of liquidation; and in many cases both provisions obtain. Usually a preferred stock carries a definite dividend or interest rate. The stated dividend rate applies to the par or face value of the stock. A seven per cent preferred stock, for example, is entitled to an annual dividend of seven per cent on par before any dividends are declared on the outstanding common stock. In some cases the dividend privileges on preferred stock lapse at the end of each year provided earnings are insufficient to meet them. In other cases the stock is "cumulative," and all unpaid dividends constitute a potential

charge against net revenue prior to the common stockholders' claims. In fact there is almost an indefinite variety of preferred stocks to be found in practice.

It is not intended here to dwell in detail upon the many possible plans which may be followed in dividing among different classes of stockholders the important aspects of proprietorship as regards income, control, etc. The fact that this division of rights, however, is not only a possibility but a widespread and growing practice, is a consideration which has an important bearing upon the accountant's conception of the corporation balance sheet. This point will be further emphasized in a moment.

A corporate organization commonly makes use of other securities than stocks in securing the capital necessary to the successful initiation of the enterprise as a business unit. Various kinds of bonds are the most familiar examples. These other securities, together with the current or floating indebtedness, constitute the liabilities of the corporation.<sup>1</sup> According to the conception of the balance sheet stressed in the foregoing pages these liabilities also represent equities in the enterprise. The economic distinction between entrepreneur and capitalist proper already referred to corresponds roughly to the distinction between stockholder and bondholder. The stockholder assumes the larger element of risk in the enterprise and has the larger element of control. The stockholder profits most if the business is very successful; and he suffers first if the enterprise is disastrous. Accordingly the stockholder, as was stated above, is the proprietor and his equity constitutes proprietorship. The bondholder's equity is classed among the liabilities proper. It should be emphasized, however, that the distinction between proprietorship and liabilities is in general much less sharp in the corporation than in the case of the simpler forms of organization. In reality the strictly legal view which looks upon the stockholders as forming the membership of a corporation is a somewhat narrow conception for the accountant. From the accounting standpoint there is at least some reason for thinking of all the individuals who furnish capital to the corporation as constituting the corporate membership.

<sup>1</sup> The corporate liabilities will be more fully discussed in Chapter XIV.

This view seems the more reasonable when the tendency toward the further specialization of securities, both stocks and bonds, is recognized. This tendency makes it difficult to maintain in the case of the corporation the sharp distinction drawn between proprietorship and liabilities, which is fairly applicable to the simpler forms of organization. It cannot be said, for example, that the fact that bonds have definite repayment dates places such securities in an altogether distinct category. Preferred stocks are often callable under specific conditions and at specific dates, and are liquidated in cash or exchanged for other securities. Again, perpetuities, which are virtually bonds without payment dates, are sometimes issued. The use of such instruments in the United States will probably increase as the country becomes older and the opportunities for speculative investment become less numerous. Further, a large bond issue is usually paid by refunding, and although the personnel of the investors may change this in a sense makes the issue perpetual. Still further, it is quite possible to finance an entire terminable project with stock issues. The stock of a wasting asset enterprise, such as a lumbering company, may be liquidated in a definite manner according to stipulations in the articles of incorporation. Incorporated philanthropic societies and similar organizations also frequently terminate after a specified number of years and the capital stock is retired at that time by definite arrangement.

A general legal distinction between stocks and bonds of considerable importance lies in the fact that legal bankruptcy ensues if bond interest is defaulted, whereas in the case of stocks such a thing is not possible. This distinction again, however, is not as sharp as the division between proprietorship and liabilities in the case of the small firm. The vast property of a modern corporation cannot be sold under the hammer. Bankruptcy in such cases means primarily reorganization; and in such a reorganization all of the equities involved in the capitalization of the business play parts according to their particular privileges and burdens. Further it might be noted that a consistent failure to pay cumulative preferred dividends may force a reorganization.<sup>1</sup> Finally it should be remembered that any individual

<sup>1</sup> For an example see the history of the United States Leather Company in Dewing, *Corporate Promotions and Reorganizations*, Chapter II.

*stockholder* has definite legal rights of procedure against the corporation in which he has an equity provided his privileges are being impaired; and because of the importance of the corporate entity such rights are of much greater significance than the similar rights of a partner.

In the matter of control it should be observed that the bondholder frequently has considerable direct and indirect influence upon the management of the corporation. Stipulations in regard to sinking fund appropriations, new security issues, general financial policies, etc., are of common occurrence in the bond contract. The bondholder sometimes has voting and veto powers in regard to important measures. Another point of importance in this connection is the fact that the bondholders come into direct control in receiverships and reorganizations. Further, in reorganizations wholesale exchanges of bonds for stocks (the reverse operation is also common) occur. Stockholders pass into the bondholder class, and bondholders become stockholders. This is also a fairly common kind of financial operation outside of reorganizations. Some issues of bonds give the holder the privilege of exchanging his security for stock under certain specified conditions. This feature is particularly common in the bond issues of mining corporations. The convertibility of bonds sometimes means that interests represented for a time at least among the bondholders have a potential majority control of the corporation.

In fact if all existing varieties of corporate securities were arranged in a series beginning with the speculative kinds of common stocks, and ending with the conservative types of bonds and similar securities, it would be impossible to group these equities between proprietorship and liabilities on any hard and fast basis. Certainly it would be somewhat unreasonable to classify the series into two divisions, one representing *ownership* and the other *debts*. It must be remembered, however, that the unit with which accounting deals is the specific enterprise, rather than corporations or securities in general, and that in the specific case the distinction between corporate proprietorship and corporate liabilities is usually a matter of considerable practical significance.

It is evident that the need for complete proprietary and other

equity accounts in the case of the corporation is imperative. It is not enough to be able to ascertain total proprietorship at any moment by subtracting the amount of the liabilities from the total of property. If the rights of the different classes of stockholders and other interests are to be preserved specific accounts must be kept which show the status of each equity. Further, an elaborate system of expense and revenue and other subsidiary equity accounts is a matter of particular importance in the case of the large scale enterprise where several interests are concerned.

The accounts representing corporate proprietorship are affected primarily at times of organization, merger, dissolution, etc., and by the process of distributing net revenue, subdividing surplus, and the like. The transactions requiring entries in Capital Stock and related accounts arise for the most part at the time of organization. Such transactions will be discussed in the following sections.

#### THE TRANSITION FROM PARTNERSHIP TO CORPORATION

The organization of a corporation frequently represents a change from the partnership form. A simple illustration of such a situation will be considered. The balance sheet of A and B, partners, it will be assumed, shows the following condition :

ASSETS		EQUITIES	
Plant . . . . .	\$50,000	A, Capital Account . .	\$22,000
Machinery . . . . .	10,000	B, Capital Account . .	38,000
Supplies . . . . .	2,500	Notes Payable . . . .	6,500
Patents . . . . .	2,700	Accounts Payable . . .	2,600
Accounts Receivable . .	1,800		
Notes Receivable . . .	600		
Cash . . . . .	1,500		
	<u>\$60,100</u>		<u>\$60,100</u>

The A. B. Co., a corporation, is organized for the purpose of taking over the assets of the old partnership and expanding the business. According to the terms of the purchase, all the assets of the partnership are to be taken over at their book value, and all the liabilities are to be assumed by the new concern as they stand. Capital stock is authorized for \$100,000, par value \$100

per share. The partners are to receive \$75,000 in stock for their equities in the partnership. It will be assumed that this agreement is consummated. What would be the closing entries on the books of the partnership?

This agreement involves the recognition of *goodwill*. The partners' equities stand on the books at \$60,000. They are to receive \$75,000 in the stock of the new enterprise. This situation almost invariably arises when a partnership is taken over by a corporation. The par value of the securities received by the partners usually exceeds the book value of the assets of the firm. The goodwill may, of course, be entirely legitimate, due to a trade name, superior selling organization, etc.; on the other hand it is very frequently illegitimate.<sup>1</sup> In such a situation the value of the stock received must be tested on a cash, or an equivalent, basis. Assuming in this case that the goodwill is authentic, then preliminary entries will be necessary on the books of the partnership to recognize this item. The amount of the goodwill, it will be assumed, is to be credited to the partners' capital accounts in proportion to their investments. The entries, accordingly, would be as follows:

Goodwill . . . . .	\$15,000	
A, Capital Account . . . . .		\$5,500
B, Capital Account . . . . .		9,500

All of the partnership assets, including goodwill, are now transferred to the A. B. Co., and the liabilities are assumed by that company. The entries covering these transactions on the books of the partnership would be:

(1)		
A. B. Co. . . . .	\$84,100	
Plant . . . . .		\$50,000
Machinery . . . . .		10,000
Supplies . . . . .		2,500
Patents . . . . .		2,700
Accounts Receivable . . . . .		1,800
Notes Receivable . . . . .		600
Cash . . . . .		1,500
Goodwill . . . . .		15,000

<sup>1</sup> See Chapter XXIV for a discussion of goodwill.



which recognizes the transfer of the assets to the corporation; and,

(2)

Notes Payable . . . . .	\$6,500	
Accounts Payable . . . . .	2,600	
A. B. Co. . . . .		\$9,100

which recognizes the assumption of the partnership liabilities by the A. B. Co. The balance of the A. B. Co. account represents the claim which the partners have against the newly organized corporation.

The partners receive \$75,000 in the capital stock of the A. B. Co. in full settlement of their claim against the corporation. The entries at this time would be:

Stock — A. B. Co. . . . .	\$75,000	
A. B. Co. . . . .		\$75,000

The partnership balance sheet would now show this condition:

Stock — A. B. Co. . . . .	\$75,000	A, Capital Account . . . . .	\$27,500
		B, Capital Account . . . . .	47,500
	<u>\$75,000</u>		<u>\$75,000</u>

The final step in liquidating the partnership will be the division of the capital stock received between the partners in proportion to their investments, and the closing of the partnership accounts. In this case the partners' capital accounts are such that the stock can be divided in exact proportion to the balances shown by these accounts. Since a share of stock cannot be divided, it frequently happens that one partner will have to take an extra share, paying the difference in cash. In this case A would receive 275 shares, and B, 475 shares; and the final closing entries would be:

A, Capital Account . . . . .	\$27,500	
B, Capital Account . . . . .	47,500	
Stock — A. B. Co. . . . .		\$75,000

In summary form the opening entries on the books of the A. B. Co. covering the transfer of the partnership assets and liabilities would be as follows:

(1)

Plant . . . . .	\$50,000	
Machinery . . . . .	10,000	
Supplies . . . . .	2,500	
Patents . . . . .	2,700	
Accounts Receivable . . . . .	1,800	
Notes Receivable . . . . .	600	
Cash . . . . .	1,500	
Goodwill . . . . .	15,000	
A and B . . . . .		\$84,100

which recognizes the transfer of the assets and the claims of A and B; and,

(2)

A and B . . . . .	\$9,100	
Notes Payable . . . . .		\$6,500
Accounts Payable . . . . .		2,600

which recognizes the transfer of the liabilities.

The balance of the A and B account shows the amount of stock due the partners. The stock is now issued to A and B. The entries would be:

A and B . . . . .	\$75,000	
Capital Stock . . . . .		\$75,000

The opening entries are evidently essentially the reverse of the partnership closing entries. The more detailed corporate organization entries usually necessary will be illustrated in the next section.

If the balance of the stock authorized were now sold for cash, the opening entries, in summary form, would be:

Cash . . . . .	\$25,000	
Capital Stock . . . . .		\$25,000

A balance sheet of the corporation at this point would show this condition :

ASSETS		EQUITIES	
Plant . . . . .	\$50,000	Capital Stock . . . .	\$100,000
Machinery . . . . .	10,000	Notes Payable . . . .	6,500
Supplies . . . . .	2,500	Accounts Payable . . .	2,600
Patents . . . . .	2,700		
Accounts Receivable . .	1,800		
Notes Receivable . . .	600		
Cash . . . . .	26,500		
Goodwill . . . . .	15,000		
	<u>\$100,100</u>		<u>\$100,100</u>

A comparison of this balance sheet and the original partnership statement shows that the important change that has occurred is in the proprietary accounts. The property accounts stand as they did before (except for the introduction of Goodwill and the increase in the amount appearing in Cash), only now they are on the ledger of the corporation. The outside equity accounts show no change; but in place of the partners' capital accounts there appears the Capital Stock account to represent proprietorship. This illustrates the fact that the type of organization adopted in any case affects the character of the accounting records primarily in the equity accounts.

#### ORGANIZATION — STOCK ISSUED FOR CASH

The opening entries in the case of the organization of a corporation are usually much more detailed than as shown in the preceding section. Another illustration will be discussed at this point. The Blank Company is incorporated under the laws of Michigan, July 1, 1918. The company plans to do a general manufacturing business. The authorized capital is \$175,000, divided into 1000 shares of common stock, par \$100, and 750 shares of preferred stock, par \$100. At the time of incorporation \$50,000 of common stock is subscribed, and \$25,000 of preferred. There are various methods of making the journal en-

tries necessary to recognize this situation. The entries might have this form:<sup>1</sup>

Subscriptions (Common) . . . . .	\$50,000	
Subscriptions (Preferred) . . . . .	25,000	
Stock Subscribed (Common) . . .		\$50,000
Stock Subscribed (Preferred) . . .		25,000

A subscription for capital stock is of the nature of a promissory note and hence is an asset of the corporation. The balance of the Stock Subscribed account represents the promise of the corporation to issue the stock when the subscriptions are paid.

At the time the subscriptions are paid the journal entries would be:

Cash . . . . .	\$75,000	
Subscriptions (Common) . . . . .		\$50,000
Subscriptions (Preferred) . . . . .		25,000

After the subscriptions have been paid in cash the corporation is required to issue and deliver the stock. The following entries would cover this transaction:

Stock Subscribed (Common) . . . . .	\$50,000	
Stock Subscribed (Preferred) . . . . .	25,000	
Capital Stock (Common) . . . . .		\$50,000
Capital Stock (Preferred) . . . . .		25,000

The balance of stock authorized (both common and preferred) is now sold immediately for cash. The entries would be:

Cash . . . . .	\$100,000	
Capital Stock (Common) . . . . .		\$50,000
Capital Stock (Preferred) . . . . .		50,000

If the balance of the stock authorized had been subscribed, and an interval had elapsed before the subscriptions were paid, then the additional entries involving Subscriptions and Stock Subscribed would be necessary. This is practically always the case.

The balance sheet of the Blank Company after the consumma-

<sup>1</sup> The entries given in these cases show the effect of the various transactions only upon the *controlling* proprietary accounts appearing in the general ledger of the corporation. The subsidiary accounts and books required will be described in a later section of the chapter.

tion of the foregoing transactions would show the following condition :

Cash . . . . .	\$175,000	Capital Stock (Common)	\$100,000
		Capital Stock (Preferred)	75,000
			<u>\$175,000</u>

It has been assumed in this and in the preceding illustration that the entire authorization of the capital stock was issued at one price — par value. Very frequently, however, capital stock is subscribed at some price other than par ; and in the case of the flotation of a large issue several different prices may be involved. In such cases it is not the par value of the securities issued that represents the stockholders' equity but the amount of the actual investment. Par value is then largely a nominal fact ; and the significance which the investor commonly attaches to this fact is unwarranted. Some states now permit the issuance of capital stock without a par value. This seems an entirely proper practice. Undoubtedly the investor is often misled by par value and formal capitalization. These facts give little clue to the amount of the actual investment and the consequent value of the company's property. It would be quite possible to enter capital stock without a nominal value in the accounting records. No difficulty arises in the treatment of partnership proprietary accounts because of the absence of a par value for proprietorship ; and none need arise in the case of capital stock. In fact a number of concerns have recently organized whose stock issues have no stated par values.

It is universal practice to enter capital stock in the accounts at par, when a par value is stated. The Capital Stock account, therefore, shows only a certain formal amount. If the stock is sold either below or above par it is then necessary to make use of the subsidiary accounts, Discount on Stock or Premium on Stock, as the case may be, to show the difference between par and actual investment. The nature and treatment of such accounts will be further discussed in the next chapter.

In some cases the stock of a corporation is underwritten by an investment or brokerage house. This usually amounts to the sale of the stock for the corporation on a commission basis. In such a case the contractual relations represented by such

accounts as Subscriptions and Stock Subscribed may exist directly between the issuing corporation and the underwriters. The opening entries in this event may differ somewhat in form from the case in which the corporation itself sells the stock to the individual investors; but the final result is the same in either case.

There is no particular advantage to be gained from opening accounts with *unissued stock* and *capital stock authorized*. This information is contained in such records as the minutes of the directors' meetings; or it usually may be found in the articles of incorporation and in the stock certificates. It is sufficient for practical purposes if the first entries in the books proper are made when subscriptions are actually received, and cover only the amount of stock actually subscribed. In fact erroneous conclusions are likely to be drawn by the stockholders and others if such accounts as Unissued Stock and Capital Stock Authorized are opened. This may be best shown by first giving illustrative entries involving these accounts.

In the case of the organization of the Blank Company (referring to the above illustration), for example, entries might have been made before subscriptions were taken as follows:

Unissued Stock (Common) . . . .	\$100,000
Unissued Stock (Preferred) . . . .	75,000
Capital Stock Authorized	
(Common) . . . .	\$100,000
Capital Stock Authorized	
(Preferred) . . . .	75,000

It is important to note that such entries represent no asset or equity facts. Unissued stock is not an asset. It represents simply a decision of the incorporators; and it may never be issued. Similarly capital stock authorized is only another expression for unissued stock and is not in any sense an equity. In fact the left-hand accounts involved in the above entries are simply offsets to the right-hand accounts, and *vice versa*. Therefore no corporate balance sheet could be prepared at this point.

There are various ways of making the later entries when the above fictitious accounts are opened. Subscriptions may be charged and Stock Subscribed credited as was shown before.

When the subscribers pay their subscriptions and the stock is issued the entries may be as follows:

(1)

Cash . . . . .	\$75,000	
Subscriptions (Common) . . . . .		\$50,000
Subscriptions (Preferred) . . . . .		25,000

and,

(2)

Stock Subscribed (Common) . . . . .	\$50,000	
Stock Subscribed (Preferred) . . . . .	25,000	
Unissued Stock (Common) . . . . .		\$50,000
Unissued Stock (Preferred) . . . . .		25,000

The resulting balance sheet (before the balance of the stock is sold) would now appear as follows:

Cash . . . . .	\$75,000	Capital Stock Authorized	\$100,000
Unissued Stock (Common) . . . . .	50,000	(Common)	
Unissued Stock (Preferred) . . . . .	50,000	Capital Stock Authorized	75,000
		(Preferred)	
	<u>\$175,000</u>		<u>\$175,000</u>

An item of unissued stock may never be sold. Many corporations at the time of organization authorize stock far in excess of the amount ever issued. In case further issues *are* necessary it is convenient to have such an authorization available so that no change in the formal capitalization (which may necessitate a revision of the corporate charter) is required. Unissued stock, if carried on the balance sheet in such a case, is simply a valuation item — a deduction from the authorized capital stock appearing on the other side. Valuation items of this type — which serve no purpose whatever — should not appear in the accounts. They are often confused with the asset items; and in any case they serve to inflate totals and consequently lead to erroneous general impressions. A great many companies always show stock *outstanding* on the balance sheet rather than stock authorized; and this is a commendable practice. If the authorized stock is shown the balance sheet might well be prepared in the following form:

Sundry Assets . . . .	\$500,000	Capital Stock	
		Authorized	\$600,000
		Less Unissued	
		Stock . .	<u>100,000</u>
			\$500,000
	<u>\$500,000</u>		<u>\$500,000</u>

If shown as a deduction in this way there is less objection to the recognition of unissued stock.

#### DONATED AND TREASURY STOCK

Capital Stock may be issued for property other than cash. This type of transaction arises very commonly in connection with reorganizations and mergers, and the taking over of partnerships. The original promoters and incorporators also often turn over services and other valuable considerations to the corporation in exchange for stock. The owner of a patent right, for example, may be instrumental in organizing a corporation for the purpose of exploiting the patent, and he may receive a large block of stock as a payment for relinquishing his patent privileges to the corporation. Similarly the owner of a mineral tract, or other natural resource, may find it necessary to take an equity in a corporation in exchange for his property in order that the mine or other asset may be properly developed. In some of these cases interesting and complex situations arise. In particular the treatment of "donated" and "treasury" stock raises some questions of importance.

A modification of the illustration discussed in the preceding section will serve to suggest the nature of these questions. Mr. Blank, it will be assumed, who is a prominent figure in the organization of the Blank Company, has subscribed for common stock to the amount of \$75,000 and preferred stock to the amount of \$25,000. He agrees to pay for his stock by turning over to the company a factory which he owns. It is further agreed that he is to donate back to the company common stock to the amount of \$50,000 which is to be sold to provide working capital. The securing of working capital is a matter of necessity. A corpo-



ration, obviously, cannot operate without having a fund available to invest in working and trading assets. The advantage of donated stock lies in the fact that such stock may be conveniently sold on the market to provide the necessary current funds.

But, it may be asked, why does not the corporation sell the original stock to outsiders in the first place? The purpose of such an arrangement as the above is to make possible the use of the phrase "fully paid and non-assessable" on the stock certificates. A stockholder, as was stated in a preceding section, is usually liable for the par value of his stock. If the amount paid in at the time the stock is originally issued is less than par, any subsequent holder of the stock, no matter at what price he makes his purchase, may be called upon by the corporation at any time to make good the difference. In other words, he may be required to pay an assessment or assessments equal to the difference between the original issuing price and par. Further, in case the corporation becomes insolvent the holder of "partly-paid" shares is usually liable to the creditors for the unpaid balance. Thus non-assessable stocks can be sold more readily to the investing public than the assessable issues. It is considered in the case of donated stock that the stock is first issued at par for property. Any stock donated to the corporation may then be "resold" at the market price to secure working capital. In those states where statutes prohibit the issue of capital stock at less than par stocks are also often issued for property with the understanding that a part of the stock issued is to be returned to the corporation. The purpose of such arrangements, again, is to make the stock fully paid in order to facilitate the raising of additional capital. In most cases the law can be complied with by such a formal transaction as the one mentioned above.

At the time Mr. Blank actually turns over his factory to the Blank Company and receives stock in payment the entries would be as follows:

(1)

Factory . . . . .	\$100,000	
Subscriptions (Common) . . . .		\$75,000
Subscriptions (Preferred) . . . .		25,000

and,

(2)

Stock Subscribed (Common)	:	.	.	.	\$75,000	
Stock Subscribed (Preferred)	.	.	.	.	25,000	
Capital Stock (Common)	.	.	.			\$75,000
Capital Stock (Preferred)	.	.	.			25,000

When Mr. Blank donates the stock to the corporation the journal entries would be :

Donated Stock (Common)	.	.	.	.	\$50,000	
Reserve for Donated Stock	.	.				\$50,000

The account Treasury Stock might be used here instead of Donated Stock. The term treasury stock, however, may well be restricted to stock once issued for value received and actually bought back by the corporation on a cash or an equivalent basis.

The exact nature of the accounts involved in the last pair of entries given depends upon the actual value of the factory turned over to the corporation. If Blank is willing to return to the corporation stock with a par value of \$50,000 it would seem reasonable to conclude that the factory is not worth more than \$50,000. If such is the case Donated Stock is a valuation account of the nature of Unissued Stock, and Reserve for Donated Stock is another valuation account — an offset to the value of the factory. A conclusion on such a question should be conditioned by the special circumstances involved in each case.

The donated stock is now sold for cash at \$75 per share. The entries (in summary form) would be :

Cash	.	.	.	.	.	.	.	.	.	\$37,500	
Discount on Donated Stock	.	.	.	.	.	.	.	.	.	12,500	
Donated Stock	.	.	.	.	.	.	.	.	.		\$50,000

If the factory is worth but \$50,000, the balance of Reserve for Donated Stock should be written off against the Factory account. The entries would be as follows :

Reserve for Donated Stock	.	.	.	.	.	\$50,000	
Factory	.	.	.	.	.		\$50,000

A balance sheet of the corporation covering these transactions would now show the following condition :

Factory . . . . .	\$50,000	Capital Stock (Common)	\$75,000
Discount on Donated		Capital Stock (Preferred)	25,000
Stock . . . . .	12,500		
Cash . . . . .	<u>37,500</u>		
	<u>\$100,000</u>		<u>\$100,000</u>

Since the outstanding common stock is worth apparently but \$75 per share, or \$56,250, the outstanding preferred stock evidently has a value of \$87,500 (the total value of the assets) less \$56,250, or \$31,250 — a value of \$125 per share.

If it be assumed that the factory is really worth \$100,000, and that Mr. Blank is willing to make this arrangement because of his interest in the success of the enterprise, this virtually means that he pays a premium of \$50,000 for his stock. This assumption would modify the above entries. Instead of using the account Reserve for Donated Stock, it would be proper to use Donated Surplus. The factory would be allowed to remain at \$100,000. The balance of Discount on Donated Stock would be closed against Donated Surplus. The resulting balance sheet would be :

Factory . . . . .	\$100,000	Capital Stock (Common)	\$75,000
Cash . . . . .	37,500	Capital Stock (Preferred)	25,000
		Donated Surplus . . . .	<u>37,500</u>
	<u>\$137,500</u>		<u>\$137,500</u>

In such a case the donated stock would, of course, be likely to sell at a higher price.

In this connection might be considered the significance of treasury stock which arises from purchases by the corporation of its own stock for cash or an equivalent. Quite commonly accountants consider such stock as an asset of the corporation, making a sharp distinction between unissued and treasury stock. As a matter of fact there is only a superficial distinction between authorized but unissued stock and stock which has been repurchased by (or donated to) the issuing corporation. Treasury stock is never a bona fide asset. The contrary opinion arises from a too rigid insistence upon the corporate entity. This can

be made clear by a consideration of illustrative journal entries and balance sheets. Suppose the balance sheet of a certain corporation appears as follows :

Sundry Assets . . . . .	\$200,000	Capital Stock . . . . .	\$300,000
Cash . . . . .	100,000		
	<u>\$300,000</u>		<u>\$300,000</u>

The directors now decide to retire a portion of the capital stock by buying it on the open market. The reasons for such a decision are various. Conditions may be favorable to a curtailment of the activities of the corporation and hence the available cash may well be returned to the stockholders. Such transactions also frequently occur when to attain certain purposes the "insiders" wish to intrench themselves more firmly in the control of the company. Whatever the reason for the transaction, the effect upon the balance sheet is essentially the same in every case. The directors in this case, it will be assumed, buy 750 shares on the open market at par (\$100). The journal entries (in summary form) would be :

Treasury Stock . . . . .	\$75,000	
Cash . . . . .		\$75,000

The resulting balance sheet would appear as follows :

Sundry Assets . . . . .	\$200,000	Capital Stock . . . . .	\$300,000
Cash . . . . .	25,000		
Treasury Stock . . . . .	75,000		
	<u>\$300,000</u>		<u>\$300,000</u>

Should this transaction be viewed as an exchange of assets or as a retirement of capital with an equal reduction in equities? The latter view would certainly seem to be the correct one from the accounting standpoint. A corporation cannot maintain its assets by buying its own stock from its own members. Treasury stock cancelled or not is essentially the same as unissued stock, — a deduction from the apparent outstanding capital stock. (Treasury stock can, of course, be issued below par labelled fully paid and non-assessable.) It is no more an asset than bank notes in the hands of the issuing bank. — Indeed in the above entries

the charge might well have been made to Capital Stock instead of to Treasury Stock, in which case treasury stock would not appear on the balance sheet at all and outstanding capital stock would appear at \$225,000, the correct figure. If it is desired to reissue the stock later on the same or another basis this can be conveniently done without recognizing treasury stock in the accounts. In any case it will be necessary to cancel the old certificates and issue new. It may be that stock once issued can be resold to greater advantage than stock authorized but not previously issued. This fact, however, would not at all justify the recognition of treasury stock as an asset. If treasury stock appears on the balance sheet it should be viewed as unissued stock, and might well be listed as a deduction from capital stock in the manner illustrated in the preceding section.

The recognition of treasury stock as an asset is a fiction similar to certain partnership transactions discussed in the preceding chapter. The accountant must at certain points brush aside the fiction of the business enterprise in order to get at the realities of the case. Obviously if a corporation purchased all of its capital stock, and paid a price based upon the actual value of the assets, the equity of the stockholders would be completely retired. (Such a situation would, of course, usually be impossible or illegal.)

#### SUBSIDIARY PROPRIETARY RECORDS

Thus far in discussing the transactions affecting corporate proprietary accounts only the general ledger accounts have been shown. There has been no description of the records which take care of the relations between the individual subscribers and stockholders, and the corporation. Where proprietorship is vested in a numerous and shifting personnel, however, it is evident that the keeping of records which show the status of each individual owner is an important and complex task. The usual subsidiary proprietary books and transactions involved in the case of the corporation will be briefly discussed in this section.

When a corporation is organized a *subscription ledger* is opened in which are recorded the details in connection with each subscription. The general ledger account "Subscriptions" controls this subsidiary ledger. (If the corporation is small, and the in-

dividual subscribers few in number, each subscriber's account might be carried in the general ledger and the subscription ledger dispensed with.) When Subscriptions is charged each subscriber's account involved in the subscription ledger is also debited with the proper amount. When subscriptions are paid the controlling account is credited and the proper individual accounts as well. The balance of the controlling account at any time shows the amount still due the corporation on all its subscription contracts, and the individual subscribers' accounts show how this amount is divided among the various subscribers. In some cases where the subscriptions are to be paid in installments a separate *installment book* is used and the controlling account, Subscriptions, is divided into several accounts corresponding to the number of installments.

A subscription is a legal claim of the nature of a promissory note, and if the subscriber fails to meet the regular calls for payment he may be sued by the corporation. If payment is defaulted and the amount is found to be uncollectible it is necessary to reverse the original entries by debiting Stock Subscribed and crediting Subscriptions for the amount involved. The defaulting subscriber's account should also be credited. In some cases the subscription contract contains a provision to the effect that any sums paid on the subscription will be forfeited to the corporation provided the subscriber fails to meet his obligations. The amount realized in such a case is a kind of gain and may be credited to Capital Surplus. (See Chapter XIII.) There may be statutes, however, which invalidate such contracts, and require the reimbursement of the subscriber for the amount he has invested.

The *stock ledger* is a subsidiary book containing an account with each stockholder which shows the par value of the stock owned by him and other details. The stockholder's individual account is credited with the par value of stock purchased by or issued to him, and is debited with the par value of any stock which is ordered transferred to other parties. Capital Stock (outstanding) is the controlling account for this ledger. When Capital Stock is credited the special stockholders' accounts are also credited with the proper amounts. The balance of each individual account shows the par value of the stock then owned

by the stockholder; and the total of all balances in the stock ledger should agree with the balance of the Capital Stock account appearing in the general ledger.

In form the individual stockholder's account appears somewhat as follows:

J. B. HAWLEY,  
Birmingham, Michigan

DATE	CERT. NO.	NO. SHARES	NAMES AND OTHER DETAILS		Dr.	Cr.
1918						
Aug. 3	127	100	Subscribed and Paid	S. J. 8		2,500
15	47	10	Transferred from A. R. Watson	S. J. 13		250
30	195	40	Transferred to W. S. Bailey	S. J. 20	1,000	
			Balance		1,750	
					2,750	2,750
Sept. 1	214	70	Balance (New Certificate)			1,750

Shares of stock, like other kinds of personal property, may be disposed of without restriction, at the pleasure of the lawful owner. "Active" stocks are bought and sold freely on the stock exchanges and the keeping of the record of the individual stockholders is a task of some magnitude. In many cases large corporations whose stocks are frequently dealt in on the market employ a transfer agent to make all transfers and keep the subsidiary books. For dividend and other purposes the current list of stockholders is then secured from the books kept by the transfer company. Since the total of outstanding stock is not affected by transfers from one person to another, the controlling account, Capital Stock, is an inactive account, showing few changes through a period of years.

In some cases stocks are assigned from person to person and the transfers are not registered on the books of the company. The records of the corporation, in other words, may not show an up to date list of the actual stockholders. The corporation, however, recognizes as voting shareholders the list from its own records, and makes up its dividend schedules from the roll of stockholders as it appears in its stock ledger.

The *stock certificate book* contains blank stock certificates and stubs. When a certificate is issued the data written in the stock certificate is also entered on the stub. Postings to the stock ledger may be made from these stubs, but where the transfers are numerous it is desirable to make use of a special *stock journal*. Cancelled certificates are sometimes attached to the appropriate stubs and kept as a permanent record.

There are many other cases of corporate proprietary transactions than those discussed in this chapter. The conversion of securities from one type to another and the retirement of serial stocks have already been referred to. Increases and decreases of capital stock in connection with mergers, business expansion, dissolution, etc., are of common occurrence under modern financial conditions. Such transactions are often very complex but no important general peculiarities in accounting for capital stock not already discussed arise in such cases. The corporate surplus and related accounts will be discussed in the next chapter.



## XIII

### CORPORATE PROPRIETORSHIP — SURPLUS ACCOUNTS

It has been stated that proprietorship in the case of the corporation is represented by the capital stock and surplus or deficit accounts. In the broadest sense, therefore, *surplus* represents the excess of actual proprietorship in a given case over the par value of the capital stock outstanding, and *deficit* — or negative surplus — represents the amount by which the par of the capital stock exceeds proprietorship. In accounting practice, however, surplus so defined may appear under a number of special heads. The accounts representing surplus and deficit form an important *group* of corporate accounts; and the numerous transactions affecting these accounts often involve difficult questions of analysis. Probably no other accounting concept is so commonly misunderstood as that of the surplus, and consequently the surplus accounts are very frequently misinterpreted. This makes the study of these accounts a matter of considerable importance. In this chapter the typical surplus accounts will be discussed and the important types of transactions affecting these accounts will be illustrated. A sharp distinction will be drawn at the outset between the two main types of surplus (and deficit): (1) that which originates at the time of organization and in connection with any subsequent sale of securities; and (2) accumulated profit or loss resulting from business operation and the accidents of the industrial situation.

#### CAPITAL SURPLUS AND DEFICIT

Very frequently when a corporation is organized the par value of the stocks issued exceeds the value of all the property acquired. This simply means that securities such as stocks are usually sold for the first time at a discount. It is common practice to write

up the property to the point at which securities are apparently validated. This is sometimes done by using "real estate, patents, machinery, etc." — or some similar caption — on the balance sheet. This practice is decidedly illegitimate. If goodwill or other intangibles are involved in any case it is proper to put these items on the books, but they should be isolated in the balance sheet and should be listed at the actual amounts carried in the appropriate accounts. The use of general balance sheet captions, and the indiscriminate writing up of property to make an apparent validation of securities issued, should be avoided. The item *discount on stock* should appear frankly on the balance sheet as an offset to stocks entered at par but issued at a discount. Both Discount on Stock and Deficit are offset or valuation proprietorship accounts. It is desirable, however, to distinguish between the two, and to restrict the use of Discount on Stock to cases where the par value of the stock at the time of issue exceeds the value of the assets acquired by the corporation in exchange. The Deficit account may then be used to indicate an offset to original proprietorship caused by losses in business operation.

A capital surplus at the time of organization is of comparatively rare occurrence in the case of American corporations. One possibility, the donated surplus, has already been discussed, but the most important case of capital surplus arises in connection with the sale of stocks at a premium. The excess of the issuing or selling price over the par value of the stock is premium. The sale of stocks at a premium is quite common in those states which prohibit the issuance of stocks at a discount by statute. In many such cases, however, where the stock is issued for property other than cash, the premium is only nominal due to the fact that inflated valuations are set upon the properties involved. Another important illustration of stock premium occurs in connection with the organization of banking corporations. Because of the actual and traditional advantages of investments in such companies their stocks are often issued at a price considerably above par.

Since stocks are always entered in the capital stock accounts at par it is necessary to open a special account in which to record the amount of the premium in any case. Suppose, for example,

that a trust company issues stock with a par value of \$100,000 at \$115 per share. The journal entries (summarized) would be somewhat as follows:

Cash . . . . .	\$115,000	
Capital Stock . . . . .		\$100,000
Capital Surplus . . . . .		15,000

Such a surplus account should have some distinctive title such as the one used here. In railroad accounting the Interstate Commerce Commission prescribes the use of the accounts Premium on Stock and Discount on Stock, for the recording of capital surplus and deficit respectively. This is a commendable practice. One source of confusion in accounting is the loose and non-standardized nomenclature. The names of accounts should give at least some clue to what they contain even if it is necessary to use rather long titles.

The later treatment of stock discounts and premiums in the accounts is a matter of considerable importance. It is usually conceded to be good practice to charge the amount of stock discount in any case against annual or accumulated profits. In fact some accountants urge that proprietary discounts be written off as rapidly as possible, so that such valuation items may be removed from the balance sheet. There is some question as to the propriety of such a procedure, however, for if capital stock has been issued at a discount the original investment is less than the par of the stock and the two accounts, Capital Stock and Discount on Stock, taken together, show the amount of original proprietorship. The Discount on Stock account is therefore really a section of the Capital Stock account. It would seem desirable to use one group of proprietary accounts (the capital stock accounts) to show investments, and another group (the accumulated surplus accounts) to reflect the amount of income retained in the business. If, however, discount on stock is extinguished by charges against net revenue or surplus the amount of the original investment is obscured, and the amount of accumulated income as well. It is perfectly proper to allow surplus to accumulate, but it is advantageous to have the amount of such accumulation segregated in the accounts. In other words, since stock discount and surplus are not exact opposites, it would be a

rational procedure to maintain Discount on Stock indefinitely on the books even though a Surplus account also appears. The amount of accumulated corporate surplus is an important fact in connection with the relations of the public to the enterprise, as well as in connection with the relations between different classes of equities within the enterprise. Any practice, therefore, which tends to disturb the integrity of the accumulated surplus figure, is questionable.

Similarly (as is generally admitted), Premium on Stock may well be considered as a permanent account — a section of the Capital Stock account. The two accounts, taken together, show again the amount of original investment. If the amount of the premium in any case is credited to a regular surplus or net revenue account either at the time of organization or later, both surplus and investment figures are obscured. Further, since dividends are often appropriated from surplus, the amount of stock premium, if added to general surplus, might appear to be available for dividend purposes. If dividends are declared from a stock premium, this simply means that a portion of the stockholders' original capital investment is being returned. While such a practice might not be considered illegal, it would usually be an unwise policy; and in any case the nature of the transaction should be clearly recognized. Premium on Stock, then, should remain in the ledger as a permanent account, until such time as a part or all of the capital stock is retired.

#### ACCUMULATED PROFIT AND LOSS

As was emphasized above it is desirable to restrict the terms surplus and deficit to their most common usage, namely, accumulated profit and loss. If a "surplus" account is used to represent any other fact, qualifying terms should be added to the account title so that there can be no doubt as to the meaning intended. Surplus, then, is the resultant of net proprietary income balances which have not been distributed as dividends. An illustration will serve to make the origin of surplus in the accounts entirely clear. Suppose that the Net Revenue account of a certain corporation shows a net revenue figure of \$40,000 available for partition among the various equities. The interest accrued on

*outstanding bonds, it will be assumed, amounts to \$10,000. The directors order a dividend posted of \$15,000, and allow the balance of Net Revenue to be carried to Surplus. The entries giving effect to this situation would be as follows :*

(1)		
Net Revenue . . . . .	\$10,000	
Interest Payable . . . . .		\$10,000
(2)		
Net Revenue . . . . .	\$15,000	
Dividends Payable . . . . .		\$15,000
(3)		
Net Revenue . . . . .	\$15,000	
Surplus . . . . .		\$15,000

Thus it is evident that the final incidence of all undistributed net proprietary income is in the Surplus account. Accumulated surplus, in other words, is the sum of the annual surpluses. Accumulated deficit, on the other hand, represents the sum of all the annual deficits (offset, of course, by any surpluses). A proprietary deficit may arise if expenses exceed revenues, if net revenue is insufficient to meet interest and tax obligations, or if dividends are paid in excess of net proprietary income. A deficit in the last case simply represents the deduction from original proprietorship due to the return of capital to the stockholders and on the balance sheet has a significance somewhat similar to stock discount.

In practice an intermediate surplus account, Undivided Profits, is sometimes used. Such an account receives any income balances which are not to be withdrawn at the end of the current fiscal period, but which may become the basis of dividends in later years. Such an account can be used as a convenient buffer to stabilize the dividend rate without necessitating an encroachment upon capital. A stable dividend rate is a great convenience to the stockholders who are depending upon their dividends to meet current personal obligations. A fixed rate also is of advantage in that it tends to promote the credit and general financial standing of the corporation. Since, however, net revenue will fluctuate year by year according to the exigencies of the

business situation, net revenue balances cannot be followed in declaring dividends if a constant rate is to be established. Accordingly in lean years the Undivided Profits account may be drawn upon, and in boom years the balance of Net Revenue after dividends are declared may be transferred to Undivided Profits. It is a mistake to suppose that a stable dividend rate depends upon a constant net revenue figure.

When an Undivided Profits account is used the Surplus account may be restricted to those items of net proprietary income which have been specifically recognized as a part of the permanent proprietorship. In the case of rapidly expanding enterprises it may be necessary to use the earnings to buy new equipment, and such a process, of course, builds up a surplus. The distinction between Undivided Profits and Surplus is not, however, a matter of very great importance. These account titles may be used interchangeably without confusion; and as a rule it is not necessary to make use of two such accounts in a single enterprise.

A surplus account might be used in the case of a single-proprietorship or partnership as well as in the case of a corporation. In fact the individual proprietor's personal or drawing account serves much the same purpose as the Undivided Profits account. Since there is no par value for proprietorship in these cases, however, it is customary to transfer income balances directly to the main proprietary accounts. Yet this process obscures original investment and accumulated income figures, and hence accounts analogous to Surplus might well be used in all enterprises.

Surplus is accumulated for various purposes, some of which have already been suggested. In general it seems to be desirable for a corporation to adopt a conservative policy in regard to dividend distributions, and to build up a buffer account which will serve to absorb, in a measure, the shock of financial stringency or other business hardship or disaster. The individual stockholder would often prefer to have larger dividends paid; but the accumulation of surplus, within reasonable limits, is usually regarded as a sound financial policy. Unless the business in any case may be conveniently expanded, however, it may be unwise to withhold any large amount of profit from the stockholders, for this would require the investment of the current

assets which are concurrently accumulating in property such as securities and similar assets. . This would mean a change in the character of the stockholders' investment, and hence might not be in accord with the best interests of the shareholders.

It needs to be emphasized that the surplus accounts are *equity* accounts. The term surplus is often used in business practice in the sense of cash and other liquid funds available. In accounting, however Surplus (or any of its subdivisions) is a proprietary equity account, representing as already explained the excess of present proprietorship over formal capitalization (less any organization discounts if used as advised above), and not representing any specific assets. Surplus, as is the case with any equity item, is balanced by assets on the opposite side of the balance sheet; but no specific asset can be tied definitely to this or any other equity. The only *inevitable* relation between assets and equities is the equality of totals. Surplus, then, may be considered as offset among the assets by equipment, cash, accounts receivable, materials or any other item.

Turning now from the discussion of the origin and general nature of surplus, it will be necessary to consider the principal subdivisions of surplus and the process of setting up these accounts. A large number of the resolutions of the board of directors affect the surplus accounts. The process of subdividing surplus is sometimes spoken of as the making of "appropriations" from surplus. In itself it is a purely formal process and can go on indefinitely without affecting the property accounts. Making appropriations from surplus simply means the putting of different labels on portions of surplus; and this process should never be confused with the setting up of assets in special funds. These appropriations may express the financial policies and intentions of the directors, however, and in this way indirectly affect the asset accounts. In the following sections typical examples of surplus appropriations will be considered.

#### DIVIDEND APPROPRIATIONS

Dividends are frequently appropriated from the Surplus account. A dividend in ordinary usage is a distribution to the stockholder of net proprietary income. As already explained,

however, the term "dividend" is sometimes applied to distributions which contain an element at least of original capital. This is particularly true in the case of wasting asset enterprises such as mining companies.<sup>1</sup> But as a rule dividends are appropriated and paid from current or accumulated profits; and except in special circumstances it is a general principle of corporation law that dividends must not be paid out of capital. As stated above, dividends are usually *assumed* to be profits; and were disbursements of capital made under this guise allowed to rank as profits the stockholders in general and other parties interested would be misled, and certain classes of stockholders and creditors might be defrauded.

The most common type of dividend appropriation (or declaration) is the cash dividend. Such a dividend may be appropriated from the Net Revenue (or Profit and Loss Allocation) account, from an account called Undivided Profits as explained in the preceding section, or from any general surplus account. If a corporation has adopted a stable dividend policy it is a convenient accounting procedure to transfer all proprietary net income from Net Revenue to Surplus, and to make all dividend appropriations from the latter account. To illustrate this procedure it will be assumed that a certain corporation has a proprietary income after interest charges are met of \$50,000. The entries transferring this balance to Surplus would be:

Net Revenue . . . . .	\$50,000	
Surplus . . . . .		\$50,000

The entries covering the declaration of a dividend of \$25,000 would now be as follows:

Surplus . . . . .	\$25,000	
Dividend Payable . . . . .		\$25,000

These last entries involve a withdrawal of \$25,000 from Surplus, and the setting up of the same amount in a special account. In a sense the Dividend Payable account represents a part of the general surplus, labeled for a particular purpose. It is true

<sup>1</sup> It is noticeable that several such companies have recently adopted the policy of apportioning disbursements to the stockholders between actual dividends and capital return.



that a declared dividend must be paid like any debt, and that a stockholder can sue the corporation for the amount of any unpaid dividends once posted, yet it seems a misnomer to call such an item a liability in the accounting sense. It represents an equity of the proprietors and hence is clearly a part of total proprietorship. Until the dividend is paid there is no change in total assets or in total equities. In the analysis of the balance sheet how should a dividend declaration be viewed? Is it not simply a special part of the corporate surplus? At any rate a dividend payable is a part of the stockholders' equity, and since the stockholders are usually considered as representing the corporate proprietors there is some reason at least for this view.

At the time the above dividend is paid the following entries would be made :

Dividends Payable . . . . .	\$25,000	
Cash . . . . .		\$25,000

These entries represent the actual payment of cash and an equal deduction from the stockholders' equity. The preceding entries represent simply transpositions of equity items.

In some cases a small balance may appear in the Dividends Payable account for a long period. It is not always possible to locate all the stockholders in the case of a corporation with a large and widely scattered membership. A small part of a dividend declaration may, therefore, remain unpaid for years, but after such items have legally lapsed the unpaid balance of the Dividends Payable account may be transferred again to the Surplus account.

Various names are applied to dividend accounts. Dividends Payable, Dividends Declared, and Dividends Posted are common examples. It is usually advisable to number each dividend declaration, and the account may be labeled correspondingly, as, for example, Dividend #1.

When a dividend is declared a schedule of stockholders' names must be prepared, and the amount of dividend due each stockholder must be computed and entered on this schedule. Such a schedule virtually amounts to an accounts payable ledger. Each individual account may be closed when a check for the proper

amount is mailed to the shareholder. All matters of procedure involved in the payment of dividends are, of course, the same whether the dividend be appropriated from current or accumulated income.

An appropriation and distribution of proprietary income to the members of a partnership may also be called a dividend. Because of the nature of the partnership as previously explained, however, a distribution of income to the partners is not as formal or important a transaction as a dividend appropriation and payment in the case of a corporation. In common usage the expression "dividend" usually has reference to the declarations of corporations.

Surplus may be appropriated as "stock" dividends. If there is an accumulated surplus a dividend may be declared even if there is insufficient cash available to pay the dividend. If income has been invested in equipment and merchandise this does not affect the showing of net revenue or the amount of accumulated surplus. The actual payment of a dividend, however, requires cash or an equivalent. Sometimes cash is borrowed for dividend purposes although the corporate treasury is temporarily empty. An alternative procedure in such a case is the issuance of either "scrip" or stock dividends. A scrip dividend may be used when it is expected that cash will be available shortly with which to redeem the corporation's formal promises to pay which have been issued to the stockholders. A stock dividend may be declared if it be decided to retain the available assets indefinitely.

A great deal of confusion exists in popular discussions of stock dividends. A stock dividend in a sense is no dividend at all. The payment of such a dividend involves no withdrawal of cash or other assets. It is purely a formal process as far as the balance sheet totals are concerned. The directors decide to issue stock certificates covering a part or all of the accumulated surplus. This is simply a formal recognition of their intention to allow this surplus to remain permanently as investment. Once represented by stock certificates it is no longer available for other appropriations. A stock dividend is really simply a portion of the surplus, renamed. This is clearly shown by an examination of the journal entries. Suppose a corporation, with an unappro-

priated surplus of \$75,000, decides to issue a stock dividend of \$50,000. The entries would be:

Surplus . . . . .	\$50,000	
Capital Stock . . . . .		\$50,000

These entries transfer a credit balance of \$50,000 from the Surplus to the Capital Stock account. (It would also be necessary to credit the individual stockholders' accounts at this time with the distribution of the new stock, *pro rata*.) The actual adjustment is usually made by calling in the old stock certificates and issuing new ones for a proportionally greater number of shares in each case.

The action of the stock market when a stock dividend is distributed (a "melon-cutting") is somewhat irrational. Usually the market price of the total of the stockholders' equity advances after such a distribution. There seems to be little real foundation for this situation. Total proprietorship is neither increased nor decreased by the payment of a stock dividend. This may be made clear by an examination of the balance sheets of a hypothetical company before and after the distribution of such a dividend. The balance sheet of the A Company (in summary form) appears as follows:

Sundry Assets . . . .	\$500,000	Capital Stock . . . .	\$300,000
		Surplus . . . . .	100,000
		Liabilities . . . . .	100,000
	<u>\$500,000</u>		<u>\$500,000</u>

The amount of proprietorship as shown by this statement is evidently the sum of the capital stock and surplus items or \$400,000.

A stock dividend of \$100,000 is now declared and distributed. The balance sheet after the consummation of this transaction would appear as follows:

Sundry Assets . . . .	\$500,000	Capital Stock . . . .	\$400,000
		Liabilities . . . . .	100,000
	<u>\$500,000</u>		<u>\$500,000</u>

In this statement proprietorship still stands at \$400,000, the balance of the Capital Stock account. The Capital Stock and

Surplus accounts have been combined. Since the assets are unchanged and total proprietorship is the same as before there seems to be no valid reason for an advance in the market value of the total capital stock. If this stock has a par of \$100 one would naturally expect the price of the stock before the new issue was made to be about \$133 per share, and after the stock dividend is issued about \$100 per share. This assumes, of course, that the balance sheet given shows the actual value of the assets. It is, however, a familiar fact that security prices do not always closely conform to what one would expect in view of the information shown by the accounts.

The issue of a stock dividend, evidently, obscures the amount of accumulated surplus and the amount of original investment. This statement suggests a common reason for such dividends. Corporations which are making huge profits, and which wish to pay but an ordinary rate of dividends on formal capitalization will often gradually transfer their accumulated earnings from the Surplus to the Capital Stock account. It is then possible to declare much larger aggregate cash dividends at the same normal rate on formal capital. In connection with public utilities this practice may also be made the basis of an argument for the maintenance of rates. A corporation, it is urged, should be allowed a fair rate on its outstanding securities. Evidently such an accounting practice gives the corporation an opportunity to beg the real question as to what rate per cent is being earned, or should be allowed, on actual *investment*.

Corporate surplus is a red flag to certain rather noisy elements in public opinion. Undoubtedly this has something to do with the practice of issuing stock dividends in certain lines of industry. These dividends "cover up" surplus. This is hardly a sufficient basis, however, for a general condemnation of the practice in the case of the ordinary competitive enterprise.

#### SINKING FUND APPROPRIATIONS

An important illustration of a type of surplus account arises in connection with the setting up of sinking funds for special purposes. A sinking fund is simply a special fund of assets (usually liquid) which is created in anticipation of some event

such as the replacement of an important unit of the plant or the maturity of a large obligation or equity. Suppose, for example, that the bond contract in the case of a corporation having outstanding \$1,000,000 of twenty-year bonds requires that each year until the bonds mature liquid assets to the amount of \$50,000 must be set aside in the hands of a trustee. (The directors might, of course, decide to adopt the sinking fund method of their own volition. This illustration ignores interest. Sinking fund calculations and entries will be fully explained in Chapter XVIII.) The entries recognizing this requirement each year would be:

Sinking Fund Assets . . . . .	\$50,000	
Cash . . . . .		\$50,000

These entries involve simply a transposition of assets and do not affect any of the equity accounts. But suppose, further, that the bond contract requires an appropriation of \$50,000 each year from net income or surplus under the title of "sinking fund reserve." (Various terms such as "reserve for sinking fund," "sinking fund" or "sinking fund surplus," may be applied to this appropriation.) The reason for such a requirement is that the bondholder is better protected if profits are being retained in the business. The entries setting up such a surplus should be carefully considered. The appropriation might be made directly from Net Revenue. In this case the entries would be:

Net Revenue . . . . .	\$50,000	
Sinking Fund Reserve . . . . .		\$50,000

The balance of Net Revenue (\$75,000, it may be assumed) might first be carried to Surplus, and the appropriation made from the latter account. The entries in this case would be as follows:

(1)		
Net Revenue . . . . .	\$75,000	
Surplus . . . . .		\$75,000

and,

(2)		
Surplus . . . . .	\$50,000	
Sinking Fund Reserve . . . . .		\$50,000

These appropriations from annual or accumulated surplus as a matter of accounting are entirely independent of the property accounts. Yet there is very common confusion on this point. Special funds, it is true, are often set up concurrently with surplus appropriations as was shown in the above illustration. But the point should be emphasized that there is no *necessary* connection between the appropriating of income or surplus and the setting up of special funds. Either transaction may occur without the other (subject, of course, to contractual provisions), and if both transactions arise simultaneously there is no inevitable coincidence between the amounts appearing in the special asset and equity accounts. From the standpoint of protection to the bondholder the appropriating of surplus as a special sinking fund reserve is probably more important than the setting up of special funds. If surplus is specifically appropriated, or labeled, so that it cannot become the basis for cash dividend declarations, this means that the stockholders' equity is being increased with a corresponding accumulation of assets. It is this process which insures the widening of the margin that protects the bondholders' equity.

Sinking Fund Reserve is not affected by the repayment of the bonds. This can be clearly shown by an examination of the balance sheets. It will be assumed that the balance sheet of the corporation mentioned above at the date the bonds were issued is as follows:

Property . . . . .	\$2,000,000	Capital Stock . . . . .	\$1,000,000
		Bonds . . . . .	1,000,000
	<u>\$2,000,000</u>		<u>\$2,000,000</u>

At the date the bonds mature the balance sheet stands as follows:

Property . . . . .	\$3,000,000	Capital Stock . . . . .	\$1,000,000
		Bonds . . . . .	1,000,000
		Sinking Fund Reserve . . . . .	1,000,000
	<u>\$3,000,000</u>		<u>\$3,000,000</u>

The following entries would be made when the bonds are paid:

Bonds . . . . .	\$1,000,000		
Cash . . . . .			\$1,000,000

Sinking Fund Reserve can now be transferred to surplus, thus :

Sinking Fund Reserve . . . . .	\$1,000,000	
Surplus . . . . .		\$1,000,000

The resulting balance sheet would show the following condition :

Property . . . . .	\$2,000,000	Capital Stock . . . . .	\$1,000,000
		Surplus . . . . .	1,000,000
	<u>\$2,000,000</u>		<u>\$2,000,000</u>

The final result shows simply that \$1,000,000 in profits has been retained in the business during twenty years. In other words the stockholders have accumulated surplus sufficient to buy out the bondholders. (This illustration assumes that cash is available at the proper time with which to retire the bonds. In the case of an expanding business the bonds would probably be paid by refunding.)

Inexact terminology is in part responsible for the tendency to confuse property transactions and the formal process of subdividing surplus. The term "sinking fund" is frequently found in practice on both sides of the balance sheet. On the left-hand side it represents special assets, on the opposite side it represents a part of general surplus. Sinking Fund Assets is the proper name for the property account, and Sinking Fund Reserve for the proprietary equity account.

#### MISCELLANEOUS SURPLUS TRANSACTIONS AND APPROPRIATIONS

A peculiar case of surplus arises when contingencies which have been anticipated do not materialize. A shipping company, for example, decides to carry its own fire insurance by charging against revenue each year the amount (\$10,000) which experience has shown to be the average annual fire loss in this type of business, and crediting this amount to an account entitled Reserve for Fire Insurance, thus :

Expense and Revenue . . . . .	\$10,000	
Reserve for Fire Insurance . . . . .		\$10,000

If safety devices and more efficient management by the end of the first year cut down the fire loss to one-half of the previous estimate a part of this valuation reserve may become a real surplus; and in such a case it could properly be transferred to the general surplus account, thus:

Reserve for Fire Insurance . . . . .	\$5,000	
Surplus . . . . .		\$5,000

In certain cases, a management, desiring to present an ultra-conservative showing, will transfer a portion of surplus to an account called "Reserve for Contingencies," or some similar name, to cover possible but unlikely losses. If the loss is *very* unlikely there is little to be said in favor of the creation of such reserves. Such a reserve is part of the general surplus and should be so considered in computing total proprietorship. For, obviously, the proprietor's entire equity is subject to loss under unusual conditions. Such a reserve might be specifically labeled to indicate the nature of the contingency, as, for example, "Reserve for Flood Loss," or "Reserve for Contingent Depreciation." Contingent reserves do not, of course, remove risks or lessen the burden of unusual losses to the stockholders. The use of such accounts, however, serves to suggest to those interested the nature of possible risks inherent in the business, and it reveals the conservative policies of the management.

These illustrations serve to suggest the relation between valuation and surplus reserves. As was explained in another connection, asset valuation accounts are often called "reserves" in practice. This is a confusing practice and, as was suggested, the term "allowance" might well be substituted for reserve in the valuation account. The two types of reserve are seldom carefully distinguished on the corporate balance sheet, and since the accountant has to deal with this situation it is important that the relation between these different groups of accounts be clearly understood.

In general the distinction between a surplus and a valuation reserve is clear. Valuation reserves are supposed to measure the expiration of certain assets which are left on the books for various reasons at original figures. The concurrent charge when such an account is credited is to some expense account. Suppose,



for example, that in a certain case the estimated depreciation of a company's buildings is \$10,000. The entries recognizing this accrual would be as follows:

Depreciation Expense . . . . .	\$10,000	
Reserve for Depreciation . . . . .		\$10,000

The charge in this case represents an expense, a deduction from gross revenue which must be made before net revenue can be correctly stated. Suppose now that the management of this company further decides to appropriate a part of the surplus (\$10,000) as a reserve for contingent losses which are possible but are so unlikely that it is not possible to make adequate provision for them by means of insurance as in the case of ordinary risks. The entries recognizing such an appropriation would be:

Surplus (or Net Revenue) . . . . .	\$10,000	
Reserve for Contingencies . . . . .		\$10,000

The Reserve for Depreciation account shows an offset to overstated assets while the Reserve for Contingencies account represents a part of the proprietor's equity, labeled in a particular way.

Where a contingent reserve simply covers the average accrual of an expiration which is capable of reasonably accurate estimation it becomes an "accrued" reserve, or valuation item. So-called contingent reserves are often of this type. The Reserve for Fire Insurance mentioned above is an illustration of such an account. In all such cases the conditions leading to such a reserve must be carefully investigated in determining its real character.

If depreciation charges have been excessive, then a part of the depreciation reserve is really a surplus item and may be transferred to the Surplus account. If the depreciation charges have been insufficient to cover actual property expirations, then a portion of surplus as stated (if there is any surplus) is a valuation item. Surplus may be charged and Reserve for Depreciation credited for the amount. Due to the difficulty of estimating depreciation exactly there is always likely to be some small overlapping between valuation and actual reserves. This does

not mean, however, that these types of accounts should not be very carefully distinguished.

The term reserve is also sometimes applied to accrued liability items. The Reserve for Taxes mentioned in a preceding chapter illustrates an account with such an item. Such a reserve, evidently, is not a part of proprietorship, but is an actual liability. Since a contingency, properly defined, is an unlikely or accidental, but possible occurrence, however, a reserve which covers a *contingent* liability is an item of proprietorship until the contingency materializes.

The nature of a "secret" reserve was suggested in Chapter X. Such a reserve is an item of proprietorship which exists but which is not booked. Secret reserves may be built up by charging improvements to expense, by excessive depreciation charges, by unreasonable allowances for bad accounts, by ignoring appreciation, by omitting certain assets entirely, or by overstating liabilities. As already explained such practices are not legitimate if the real situation is known. While conservatism in accounting is to be commended, the actual understatement of proprietorship is illegitimate. The insiders may know the facts, but the other interests in the enterprise who also have a right to the facts are not informed as to the actual state of affairs. All *known* surplus should appear on the books. Certainly it is one purpose of corporation accounting to follow and present the actual status of the stockholders' equity.

There are many other cases of surplus accounts and surplus transactions. In railroad accounting a common illustration of an account representing a special surplus appropriation is Reserve for Additions and Betterments. The journal entries setting up an appropriation of \$50,000 in such an account are as follows :

Surplus . . . . .	\$50,000
Reserve for Additions and Betterments . . . . .	\$50,000

Such an appropriation is simply a formal recognition of the fact that income has been retained in the business for a particular purpose. The special surplus account involved is sometimes called "Reserve for Improvements."

Surplus also arises where appreciation is recognized, as was

explained in a preceding chapter. Gifts present still another case. If a gift of real estate, for example, is made to the corporation either at the time of organization or later, the concurrent credit when Real Estate is charged should be made to a special surplus account. A Donated Surplus account might well be used in this case. Such a surplus should be distinguished from accumulated income. Surplus may be increased if the corporation buys a portion of its own stock at less than book value. Surplus is correspondingly diminished if such stock is bought at a price above book value.

No attention has been given thus far to special accounts involved under the general head of accumulated loss or negative surplus. The possibilities here are far less numerous. The Deficit account should be used to show such a deduction from proprietorship. Sometimes a deficit which the company is unwilling to recognize as such is set up as a deferred expense as explained in Chapter X. Such an account may appear on a balance sheet even if the company involved is having fair success. Usually, however, if surplus is available any large loss should be charged against surplus rather than being set up under a special head. Sometimes the available surplus is largely appropriated in special accounts, and the directors, not wishing to reverse an established accounting policy, will allow a deficit to appear concurrently with such special surplus accounts. The propriety of any considerable extension of such a procedure is doubtful.

Many further illustrations might be given of particular surplus accounts. The cases described, however, are among the most important. Some of the situations mentioned will be dealt with further in later chapters. In Part Five particular attention will be given to the interpretation of such special proprietary accounts in the corporate balance sheet. It should be emphasized, in conclusion, that an important part of the accounting entries in the case of the corporation are of the formal type, concerned with changes in the current proprietary accounts which are made for the most part upon authorizations by the board of directors.

## XIV

### THE LIABILITIES

THE distinction between proprietorship and liabilities has already been emphasized in some detail in preceding chapters. In general the proprietors carry the greater burden of risk, are vested with the larger element of control or management, and (as is implied in the risk burden assumed) have residual rights to assets as either income or principal. The "creditors" (whose equities constitute the liabilities) assume less risk and have less direct control, and have prior or contractual rights to assets as income or principal. Several chapters have now been devoted to a consideration of proprietorship and the proprietary accounts. In the present chapter — to complete the discussion of the equities — the important types of liabilities will be described, and the nature of some of the accounting problems that arise in connection with such items will be suggested. The more important and difficult questions that concern the treatment of the liabilities in the accounts have to do with the problem of interest calculation and the analysis of interest transactions. These questions will be considered in detail in Part Three of the text. This chapter, therefore, will be confined primarily to a more complete description of the various kinds of contractual equities than has been possible heretofore. Particular attention will be given to the important classes of corporate contractual securities.

#### ACCOUNTS AND NOTES PAYABLE

The importance of the division between *fixed* and *current* items in the case of both assets and equities has been emphasized repeatedly in the preceding chapters. Similarly it should be noted at the outset that the liabilities may be conveniently grouped

into fixed and current items. Such a classification in any case is not only an important matter of principle but has a very practical significance in the determination of the financial status of a given enterprise. A division of the liabilities of a company into funded or long-term indebtedness and floating or short-term obligations would serve to throw considerable light upon the immediate financial status of the enterprise. Typical liabilities may be settled or retired only with cash or an equivalent, and the position of an enterprise showing a satisfactory relation between total proprietorship and total liabilities might as a matter of fact be precarious if an undue proportion of the outside equities were of the short-term type. In the preparation of a balance sheet, therefore, the classification of the liabilities into groups is a matter of importance, and in the case of an enterprise with a complex capitalization such classification may be carried very far — much beyond a simple division into fixed and current items. If a management is to adopt at all times a financial program which will meet the exigencies of the capital market and the general industrial situation, it is necessary that the accounts and statements present an intelligible analysis of the liabilities.

Among the current liabilities an equity which is of almost universal occurrence is that represented by the accounts payable. An account payable is usually based on a verbal or informal promise to pay. Such liabilities originate most commonly when a company buys merchandise, materials, supplies or other assets on credit, or, in other words, postpones payment. Accounts payable usually run from ten to ninety days.

The accounting problems arising in connection with accounts payable are not very complex. When goods are purchased on credit the asset account involved is charged and Accounts Payable is credited. If the account involves alternative terms of settlement special valuation accounts may be needed, for accounts payable are entered on the books at the gross figure and this gross figure in one way or another must be accounted for. If a discount is allowed for prompt payment, for instance, the amount of the allowance is credited to an account such as Purchase Discounts. As previously explained such discounts are in effect deductions from the cost of goods purchased. In this connection there is a sense in which it might be said that an account

payable depreciates. If an account appearing on the books at \$500 is settled in full for \$490 in cash, the account is virtually written down. This is a revaluation only in a fictitious sense, however, as the account was really overstated to the amount of \$10 in the first instance. When the account is paid the amount of this overstatement is transferred to a valuation account.

The interests represented by the accounts payable are usually *equities* in the enterprise only in a limited sense. When one merchant sells another merchant goods the relation between the two is essentially a buyer and seller relationship, and the seller does not invest his capital in the enterprise of the buyer. Yet if the buyer postpones payment the vendor has a claim against the vendee equivalent to the price of the goods involved — a claim enforceable by regular legal procedure if payment is not made as stipulated or within a reasonable time. In some instances title to the specific assets involved may rest for a time in the seller, but this is not usually the case. Instead of a title to the specific assets sold the vendor usually has a general claim against the assets of the buyer and is said to have an “unsecured” claim because he has no lien on specific assets and his rights are subsidiary to any such liens and other prior claims.

Although as will be explained in the next chapter interest is involved in all time transactions there are usually no explicit distributions of income to the creditors whose claims are represented by the accounts payable. The question of income, however, is in part responsible for the usual alternative terms of settlement referred to above. The seller of a bill of merchandise, for example, offers a cash discount of two per cent if the bill is paid in ten days. If the buyer allows the discount privilege to lapse he is in effect making a distribution of income to the accountholder. Suppose the bill is for \$1,000. The entries at the time of purchase might be:

Merchandise . . . . .	\$1,000	
Accounts Payable . . . . .		\$1,000

If the bill is paid after the discount lapses the entries would be:

Accounts Payable . . . . .	\$1,000	
Cash . . . . .		\$1,000

It may be said that of this charge to Accounts Payable the amount of \$20 is a distribution of net revenue to an outside interest. The entries at the outset, it might be urged, should be as follows :

Merchandise . . . . .	\$980	
Accounts Payable . . . . .		\$980

and at the time of payment,

Accounts Payable . . . . .	\$980	
Net Revenue (Interest, etc.) . . . . .	20	
Cash . . . . .		\$1,000

While as a matter of theory there is some force to this analysis it would probably be fantastic to attempt to present it in the accounts. As a matter of fact, moreover, many factors contribute to the amount of discount allowed in any case besides the matter of interest or other phases of income.

Still it must be remembered that there is an important sense in which the creditors represented by the open book accounts constitute an equity in the ownership of the enterprise. In some cases accounts draw interest according to the terms of the sale if unpaid after a certain date. In such a case contractual income is explicitly involved. Further it should be noted that although the specific items which make up the accounts payable of a particular company are highly current in character the *total* of such accounts may be a relatively stable amount, and may also form a considerable part of what might be called the company's capitalization. In other words the floating debt represented by the accounts payable may be constantly a significant part of total ownership. Occasionally the accounts payable are largely in the hands of one company and virtually constitute a silent partner's equity from the accounting standpoint. In some cases the claims of the merchandise creditors mount into millions of dollars ; and there are instances in which such creditors have played very prominent parts in the reorganization of financially embarrassed corporations, and have taken stock and other securities in the reorganized company in settlement of their claims.<sup>1</sup>

<sup>1</sup> A notable example is found in the reorganization of the Westinghouse Company in 1891-92. See Dewing, *Corporate Promotions and Reorganizations*, Chapter VII.

Promissory notes constitute an important type of liability. Such notes may be either current or long-term in character. Short-term notes arise primarily in connection with commercial transactions similar to those involving accounts payable. An enterprise buys goods and postpones payment but gives a promissory note, or written promise to pay. Such a liability is sufficiently distinct from an open book account that it is considered necessary to set it up in a separate account. The note itself is sometimes looked upon as the liability rather than the claim of some specific person or company and the highly negotiable nature of such instruments makes this view the more reasonable as the noteholder, whoever he may be, has the claim against the maker. Such notes may be drawn with or without interest. The following illustration shows the form of a promissory note:

ANN ARBOR, MICH.

April 17, 1918.

\$500

Sixty days after date I promise to pay to the order of W. W. Stavin five hundred dollars, for value received, with interest at six per cent per annum.

A. B. POWERS.

Transactions involving the making and paying of promissory notes, and the payment and accrual of interest on such notes, have already been explained, and some further illustrations will be given in the next chapter. It is generally true of notes payable and other liabilities that the problems of valuation do not arise as in the case of the assets. Yet though liabilities do not depreciate or appreciate in the ordinary sense, the accountant must recognize the possibility of book changes in the liabilities which arise outside of actual transactions. The book value of a liability may increase, for example, because of the accrual of interest. In Part Three the variations in the values of liabilities in both directions due to interest accruals will be fully discussed.

There are many different kinds of notes and similar formal evidences of indebtedness. Accepted bills of exchange, or thirty, sixty or ninety-day "sight" drafts, are in effect promissory notes and may be treated as such in the accounts. Bank "notes" are a somewhat similar type of liability. Notes of this kind are usually made payable to the bearer on demand and are so highly



standardized and safeguarded that they constitute a regular part of the currency. These notes are non-interest bearing and yet circulate freely at par. The noteholders in this case are a rapidly changing body of whom the bank has no record. Although the notes are payable on demand they may wander far from the point of issue and may circulate indefinitely. The present issue of war-savings stamps is an example of a kind of long-term non-interest bearing government note. Interest is, however, involved in such an instrument in that the note accrues to par during its life.

The equity of the noteholders, also, may constitute in a given case an important element in total ownership; and the interest accrued on notes payable may represent a significant distribution of net revenue. Corporations make use of special kinds of notes in many cases as an important means of raising capital. Such notes may run for several years and may constitute an important equity on the balance sheet. In some cases the noteholder also may be virtually a kind of silent partner, for although promissory notes usually run for a year or less a particular note may be renewed at successive maturity dates and hence may become a permanent equity. More commonly, however, specific notes and accounts payable are liabilities which must be actually paid in cash within a comparatively short period. If the noteholder does not contemplate an actual investment in the enterprise of the maker of the note, he will usually insist upon withdrawing his capital upon the termination of the contract.

#### ACCRUED, DEFERRED AND CONTINGENT LIABILITIES

Accrued liabilities are current claims which are recognized at the time of closing the books. Common examples are wages payable, taxes payable, rent payable and interest payable. These liabilities are recognized in the accounts in order to preserve the integrity of the accounting period and to present a correct exhibit of a company's financial condition in any case. Such items are usually retired within a few days or weeks after the books are closed. Liabilities of this kind usually do not assume significance in amount, and hence do not represent an important element in the ownership of an enterprise. The

laborer, for example, does not make an investment in the enterprise in the ordinary sense. He rather sells his service at a price. As in the case of accounts payable, however, the postponement of payment virtually gives him an equity. Further, it might be noted that in waiting for his wages the laborer actually carries a part of the capital burden of production. A small part of his wage, therefore, is really pure interest. The accountant, however, is not interested in the division of wages into its ultimate economic elements. But he is interested in seeing to it that all accruals of expense are charged against current revenue and that all claims which must be met are shown in the balance sheet. The accrued liabilities, as in the case of notes and accounts payable, must be retired shortly with cash or an equivalent; and unless such items are exhibited the accounts do not present the actual financial status of the enterprise. Occasionally such accrued items may accumulate to a considerable amount. Methods of accounting for accrued liabilities were explained in Chapter VIII.

Corporate dividends declared and payable represent a special kind of current liability. As was explained in the preceding chapter a dividend payable is a part of the stockholders' equity in a sense; yet at the same time such an item is a liability in that it constitutes an obligation of the enterprise as an entity which must be met. Cumulative preferred dividends unpaid sometimes come to represent a large figure on the books. If there is small prospect of payment such a liability, it should be recognized, stands on an entirely different level from the regular liabilities.

It is interesting to note at this point the legal positions of some of these different classes of liabilities in point of risk. In general accrued wages and taxes occupy a prior position to all other claims, not excluding mortgage liens. Other current liabilities as a rule, however, are not in as favorable a situation in this respect. The claims of noteholders and accountholders are usually subject to the interests represented by the funded debt. Between the capital liabilities in turn many differences in this connection arise. In liquidation or reorganization securities such as mortgage bonds take precedence over debentures and similar equities. As a rule all other liabilities rank prior to

dividends payable. All proprietary equities, of course, follow the liabilities as a class in rights to assets.

There are certain liabilities which are finally paid not in cash but in commodities or services. These items are sometimes called "deferred" liabilities. Suppose, for example, that a newly organized fire insurance company inaugurates a big selling campaign and writes insurance during the first year of business which yields premiums amounting to \$800,000. The entries covering the payment of premiums, it may be assumed, are as follows:

Cash . . . . .	\$800,000	
Premiums . . . . .		\$800,000

At the end of the year it is found that of this amount \$450,000 represents premiums applicable to unexpired insurance. This means that the company is obligated to furnish during future periods an amount of its service, risk-taking, with a selling value of \$450,000. At this time the following entries might be made:

Premiums . . . . .	\$350,000	
Revenue . . . . .		\$350,000

The balance of the Premiums account should appear on the balance sheet as a deferred liability.

This is simply another illustration of the deferred credits to income discussed in Chapter X. Prepayments in connection with leases and similar contracts give rise to such items on the books of the party receiving payment. Such a liability is sufficiently distinctive to be set up under a special head in the accounts and statements. In some cases (as in the above illustration) such an equity may be one of the most important items on the balance sheet. No income explicitly accrues to such an equity, and the item is extinguished by the furnishing of a service rather than by being retired with cash payments.

A *contingent* liability is not an existing obligation or equity but a possible one. Certain contractual conditions exist in the case of nearly every enterprise which may give rise to liabilities not appearing on the books. The most common case arises where a company endorses and discounts its notes receivable. This

case and a possible accounting treatment for it was explained in a preceding chapter. Another illustration may be taken from corporation finance. A company may guarantee the dividends on the stock of a subsidiary company, or the principal and interest of the subsidiary's bonds. Such guarantees imply contingent liabilities as the company may be called upon to make good its guarantee from its own assets. A terminal company sometimes furnishes a similar illustration. Several railroad corporations, for example, combine to organize a company to build joint terminal facilities. Each company agrees to pay a certain percentage of the operating expenses, and of the principal and interest of the securities of the terminal company. If each company is jointly as well as severally liable this means that if any of the parties to the undertaking should default on the agreement, the other companies would be responsible for the amount defaulted. A contingent liability in the case of each company is evidently involved in such a situation.

There are many other illustrations of contingent liabilities. A corporation owning assessable securities in another company is contingently liable for the amount of such possible assessment. Analogously the company issuing the security has a contingent asset for the same amount. In fact, wherever guarantees involving a possible loss are undertaken there is a contingent liability.

In general it may be said that it seems to be the better practice to omit contingent liabilities from the books proper altogether for it is the function of the accounts to present the actual situation rather than the contingent situation. Obviously the entire status of the assets and equities in any enterprise might be radically altered by contingent circumstances easily conceivable. Where a definite possibility exists it might be recognized by a footnote on the balance sheet. Indeed the use of supplementary forms and statements to present certain facts which do not directly affect either the assets or the equities but nevertheless have an important bearing upon the general financial status and prospects of the enterprise might well be extended. From the auditor's viewpoint contingencies of a definite kind cannot be entirely ignored in the financial statements.

## MORTGAGES AND BONDS

A mortgage is a liability consisting essentially in a lien upon some specific asset or assets or upon the general assets of some enterprise. Such instruments as mortgages, particularly real estate mortgages, may run for a long period of years. A mortgage normally carries an interest rate corresponding roughly to the prevailing rate on promissory notes (sometimes a little lower). The typical mortgage carries rights to income and principal which are prior to the claims of the unsecured general creditors.

There are many kinds of mortgages. The mere name mortgage does not always carry with it the degree of security which the investor in mortgages traditionally attaches to such instruments. Mortgages may be placed upon real estate, equipment, or almost any other kind of asset. Mortgages may be first, second, third, etc. In the distribution of income or in the liquidation of capital assets in any case the mortgage holders stand in order according to the kind of mortgage held by each class. A first mortgage, as the name implies, is in general a much more substantial equity than a second or any subsequent mortgage. A first mortgage on the plant of a manufacturing company which amounts to but ten per cent of the value of the property, is but little safer, however, than a second mortgage on the same property for an additional ten per cent.

The accounting for mortgages payable is similar to that for notes payable. The amount of the mortgage is credited to the Mortgages Payable account, and the amount of cash or other assets received is debited to the appropriate property account. Discounts on ordinary mortgages seldom arise. The amount invested is equal to the face of the mortgage. In other words the stated interest rate is usually the effective market rate for the particular type of equity involved. Arrangements are commonly made by which a mortgage may be paid in installments; in other cases the entire amount may be paid only at maturity. Interest is usually paid either once or twice per year.

The holder of the typical real estate or chattel mortgage has little control of the operation of the enterprise involved.<sup>1</sup> If

<sup>1</sup> Mortgages are also a common type of indebtedness involved in the ownership of assets such as dwelling houses, which are not used in production.

interest or principal is defaulted the mortgagee may foreclose and possibly force the sale of the incumbered assets to satisfy his equity. The mortgage contract sometimes contains a provision empowering the mortgagee to sell the mortgaged property upon the non-payment of the debt, and to apply the proceeds to the liquidation of the mortgage. Such special mortgages may eliminate the need for foreclosure proceedings.

As was stated in a preceding chapter the most common type of liability arising in American corporation finance is the *bond*. A bond is a formal instrument of indebtedness widely used by incorporated companies in raising capital. As an illustration of the extent to which such securities are issued it might be noted that of the total capitalization of American railway companies over fifty per cent is represented by various types of bonds. Bonds are also commonly issued by manufacturing companies and other industrials. In fact comparatively few large corporations are financed entirely by stock issues.

The general distinction between stocks and bonds has already been explained. The point should be reiterated that the investor in a corporation whose equity is evidenced by a bond must be thought of as an owner and not merely as a creditor — an outsider. In financing a corporation the bond issues constitute as much a part of the original capitalization as the stock issues. The capital furnished by the bondholder is essentially a part of the permanent investment, and is furnished to the corporation as an entity, not to the stockholder. In a sense all of the investors, bondholders as well as stockholders, constitute the membership of the corporation.

A bond consists in a formal contract which contains a promise to pay a certain definite sum (\$1,000, for example), the par of the bond, at the date of maturity, and certain smaller periodic payments, the bond interest. A bond is a long-term security. The different issues run from ten to fifty years, or even longer. The bond interest is usually paid twice a year. Bonds may be either coupon or registered. A coupon bond is not made out in the name of any particular person and hence is readily negotiable. The principal is made payable to the bearer, and the interest is paid to whoever presents the detached interest coupons. A registered bond is registered on the books of the company in the

name of a particular party, and interest and principal are then payable only to the registered holder. Such a security may be transferred, however, in much the same manner as a stock certificate.

Bond issues are often based upon mortgages. A corporation desiring to raise capital may place a mortgage on its properties somewhat similar to the ordinary mortgage. The corporation would have difficulty, however, in raising the necessary capital directly on the basis of a single mortgage contract. The mortgage is therefore deposited with a trustee, and an issue of bonds, secured by the mortgage, is emitted. The individual bonds can then be written in convenient denominations and can be readily sold to investors.

The mortgage contract is often an elaborate document giving to the bondholder a considerable degree of indirect control over the general business and financial policies of the corporation. If interest or principal is defaulted the bondholder comes into almost complete control of the affairs of the corporation under the mortgage right of foreclosure. The tendency in corporation finance seems to be more and more toward the placing of limitations upon the absolute control of the stockholder.

There are many types of mortgage bonds. In the first place a bond may be issued on the basis of a mortgage covering only a part of the corporation's property, or the mortgage may constitute a lien upon all of the present assets and any assets that may be acquired in the future as well. Further, a succession of mortgages, and corresponding bond issues, may be issued against the same property. All kinds of combination mortgages are used. A particular bond issue, for example, may be based upon a first mortgage upon some assets and a third mortgage upon other assets. The name used in the prospectus is often not a reliable index of the nature of the security back of the bond issue. A careful inquiry into the nature of the mortgage contract upon which the security rests might well be made by the prospective investor.

"Debenture" bonds and "income" bonds represent other types of corporate equities. The debenture bondholder, in the absence of special stipulations, is in much the same position as the general creditor. Debenture bonds are often issued by a

corporation which already has outstanding mortgage bonds. In other cases a corporation will issue this type of security and make no use of mortgages. Although debentures do not carry the privileges of mortgage bonds a particular issue may represent a very conservative investment. In general the character of corporate liabilities is determined in large measure by the nature of the particular enterprise involved in any case as well as by the special contractual privileges which obtain.

Income bonds have not proved to be a desirable form of security. The income bondholder has very little control, either direct or contingent. The interest is paid only if earned. There are so many possibilities of manipulating the accounting treatment of transactions affecting net revenue in such a case to the advantage of the common stockholder that it is very difficult to protect the interests of the bondholders adequately. The stockholder is content to see income retained in the business so that a dividend may be earned on this property in the future. The methods of building up secret reserves referred to in the last chapter may be employed to the bondholder's disadvantage. In the absence of a very complete governmental or contractual control of the accounting procedure it is difficult to prevent such practices, or to secure redress for the bondholder.

There are still more highly specialized kinds of bonds than any yet mentioned. "Equipment" bonds may be secured by liens upon specific units of equipment such as railway cars or vessels. "Collateral" bonds are based upon a subsidiary issue of stock or bonds held by a trustee. Such bonds are often used in connection with a combination of two or more enterprises by means other than an actual merger. A company, for example, may borrow sufficient funds on promissory notes to buy a large or controlling interest in the stock of another company. This stock may then be deposited with a trustee and be made the basis of an issue of the holding company's own bonds, the proceeds from the sale of which may be used to retire the outstanding notes. "Serial" and "convertible" bonds are often issued, particularly in the case of mining and similar companies. A serial bond issue is one in which the bonds mature in regular installments. Convertible bonds may be exchanged for stocks under certain conditions.



The corporate form of organization is indeed marvelously well adapted to the specialization of equities. There is practically no limit to the possible variations in corporate securities which may be devised by ingenious financiers. By means of different kinds of stocks and bonds the tastes of practically every type of investor may be suited. All of the important sources of capital in the community may thus be tapped in the organization of a single large corporation. In this respect the simple partnership or single-proprietorship is comparatively very much handicapped.

The more important accounting questions arising in connection with such liabilities as bonds have to do with the calculation of interest and principal and the treatment of these items in the accounts. As was stated above this subject will be fully discussed in Part Three but some questions arising in connection with the retirement of bonds will be briefly considered at this point.

The length of time a bond is to run should bear some relation to the length of life of the property upon which the security is based. The amortization of equipment bonds, and the bonds of wasting asset enterprises such as mines and timber companies, should be provided for in some regular way. One method of providing for the maturity of such liabilities is to accumulate a sinking fund out of revenues sufficient to meet the obligation at the due date. The chief disadvantage of such a fund lies in the fact that it will usually earn a rather low rate of interest since it must be invested in high-grade securities in order to serve its purpose. Another method is to issue the bonds with serial retirement dates, though such a bond issue has certain disadvantages. If emitted at a discount serial bonds cannot be priced evenly on the market and this makes the security unattractive to the investor. Those bonds which have the shortest time to run will sell for higher prices than the blocks with a longer life.<sup>1</sup> Still another way to reduce the liability is to buy an amount of bonds on the market each year equivalent approximately to the amount of an appropriate sinking fund installment plus the accumulation on such a fund.

Bonds called or bought back by the issuing corporation present

<sup>1</sup> The reason for such a pricing will become evident as the chapters on interest transactions are studied.

essentially the same accounting problem as treasury stock. Such bonds may be kept "alive" in the treasury or may be cancelled. As in the case of treasury stock, however, the bond of a corporation in its own treasury is always virtually "dead." It could not be issued again as it stands. Such bonds are not an asset but a deduction from the amount of the outstanding liabilities. The claim which a corporation holds against itself can hardly be considered an asset. If listed among the assets redeemed bonds should be considered as a valuation item.

In conclusion certain special types of securities somewhat akin to bonds should be mentioned. Perpetual liabilities, or *perpetuities*, are not common in American finance, but there are a few cases of such equities. A perpetuity is essentially a bond having no due date. The bond does not mature, hence there is no provision made for the repayment of the principal investment. In this respect such a security is similar to a stock issue. Income, however, accrues on a contractual basis and the holder of the perpetuity usually has little or no control. The English consols are an example of a government security of this type.

Insurance companies sometimes secure capital from a certain type of investors on the basis of *annuities*. The annuity as a security is an instrument containing the promise to pay to the investor a certain number of annual sums, though a series of semiannual or quarterly payments may also be called an annuity. In the case of life annuities the number of payments depends upon the length of life of the investor or beneficiary. The investor in an annuity furnishes a certain amount of capital and receives a series of contractual sums. Income and principal are both involved in these payments. The calculations and accounting problems arising in connection with annuities will be fully discussed in Chapters XVI and XVII.



**PART THREE**  
**THE INTEREST PROBLEM**



## XV

### A GENERAL ANALYSIS OF THE INTEREST PROBLEM

FREQUENT reference has been made in preceding chapters to transactions involving interest. Particularly in Part Two, in connection with the equity accounts, it has been necessary to mention the importance of interest in the accounting records, and to stress the fact that the distribution of net revenue to the various classes of equities is largely based on the interest contract. In the succeeding chapters, moreover, especially in Part Four, on the valuation of assets, this question will arise repeatedly. In all cases where it has been necessary to recognize interest, the question of its computation has been deferred to this part of the text as many purely technical questions are presented in connection with the computation of interest and the analysis of transactions involving the interest phenomenon. Several chapters of the book will now be concerned with the more important of these questions. Many of the topics discussed here have already been mentioned in connection with the equity accounts, and some will again be taken up in connection with the asset accounts. This part will therefore serve as a technical basis for the other problems mentioned.

#### THE INTEREST PHENOMENON

The interest phenomenon presents itself in two different forms in connection with business transactions. In economic discussions these are called "explicit" and "implicit" interest transactions, and the accountant needs to understand the distinction thoroughly. Explicit interest is the type of interest explicitly mentioned in definite credit relations expressed by some form of contract such as promissory notes, mortgages, bonds, etc. Implicit interest refers to the interest involved in the ownership of any durable asset and is an important accounting consideration

because the difference between the immediate purchase price of such an asset item and the sum totals of the revenues which it will produce in the future represents in part at least implicit interest. This is what is meant when the manager says that in addition to providing for other items, the selling price of his product must be high enough to pay interest on his investment.

Explicit interest as was stated above arises in connection with contractual loans. A large part of the capital invested in the average business enterprise is obtained through what is commonly termed borrowing. The firm issues some form of promissory obligation in exchange for present funds to be used in obtaining various asset items. The amount of the funds received is less than the amount which the firm promises to repay in the future. This difference is explicit interest. It is convenient, however, to classify the forms of loans of this type into two classes on the basis of the length of time involved in each case. From the accountant's point of view the first class, called short-term notes, are all such obligations which run for periods less than a year. The banker is inclined to call all such obligations which run for over ninety days "long-term," but the accountant classifies as long-term securities only those which run for a year or longer periods.

Short-term notes are given usually for the purpose of raising current funds to meet current liabilities. Bankers speak of this form of loan as a merchandising loan. The manufacturer borrows on his sixty-day note to enable him to make immediate payment for his materials and labor while waiting for payment from his customer the jobber. The jobber in turn, on receipt of goods from the manufacturer, borrows on his sixty-day note in order to make prompt payment while waiting for receipts from his own customers, for example, the retailers. These are all short-term loans made for the purpose of financing immediate purchases. The assets obtained are listed among the current assets and the notes are listed among the current liabilities. Likewise the interest involved is usually placed in the Commercial Interest account. The complications which arise in connection with this class of loans will be discussed more fully in the next section.

Long-term securities are issued primarily for the raising of capital to be invested in fixed assets and hence usually run for a much longer period than promissory notes. Bonds, long-term

notes, annuities, etc., characteristic of this class, run for periods of from one to one hundred years. Most bonds, however, run for less than one hundred years though some securities, such as the British consols, run in perpetuity. The assets obtained from these security issues therefore will largely be represented in the fixed asset accounts while the securities themselves will be placed among the capital equities. Moreover, the interest involved is placed in special interest accounts; in fact it is often deemed advisable to keep a special interest account for each security outstanding, and this class of interest transactions will therefore be discussed further in a later section.

It is unnecessary at this point to go into a lengthy discussion of the nature and origin of interest, but it is essential for the accountant to realize that interest, either explicit or implicit, enters into every transaction where time is an essential element. The fact that it exists in every computation involving time is very generally recognized, and two types of characteristic calculations commonly made by business men show further that computations involving implicit interest are consciously made. In the first place if a bid is to be made for the purchase of an asset the future revenues of which are definitely known, the business man will discount the revenues, thus making the purchase price considerably less than the sum of the revenues. This difference is interest. The amount of revenue received each year in such a case consists of, (1) a return of part of the purchase price, and (2) interest on the investment. The second general type of implicit interest is made evident when the manager of a plant is about to state a price for his product; for he adds a certain amount to the regular expenses to "cover the interest" on his investment. These two types of calculations, of course, are just two different methods of computing implicit interest. The first recognizes that money due in the future must be discounted to find its present value, and the second that interest is an economic cost of production.

In commercial accounting the implicit interest item is seldom calculated separately but is included with the profits in the net revenue figure. For instance, the net revenue figure which is carried from the expense and revenue statement down to the credit side of the net revenue statement includes interest on the investment. If the firm is prosperous it also includes a con-



siderable profit, if poorly managed even interest will not be earned although this situation cannot continue without leading to bankruptcy. The operating net revenue, then, includes the interest return on the investment. Additions are made to this figure in the net revenue statement through receipts of explicit interest and deductions through distributions of explicit interest. The final net balance is therefore made up of interest on the proprietary investment and pure profit.

There is a very close relation between the interest element in operating net revenue and the value of the assets used in producing the revenue. In the purchase of assets having definite future revenues this value may be obtained by a mathematical computation. The relation between the revenue and the value of the asset is fixed at the date of investment by a discounting process. In determining the price of a product the relation is somewhat more obscure but is nevertheless present. The manager invests in a machine which will last ten years because, in view of all the conditions which he can foresee, the revenue attributable to the machine will be in excess of the purchase price. Or, stated in another way, he will fix the price of his own product at a point which will enable him to obtain the market rate of interest on the investment. In any case, if he is successful, net revenue will yield a reasonable interest return on the investment. There is then a relation between the value of the asset and the interest return which should as far as possible be recognized in the accounts. Its bearing on the problem of valuation will be discussed at some length in Part Four, but some of the questions dealing with interest in valuations will be mentioned in the last section of this chapter.

#### COMMERCIAL INTEREST

Commercial interest is the term generally applied to interest paid or received on short-term notes. No fixed rule can be laid down as to what constitutes a short-term note but usually it is assumed that one year may be taken as the limit of this class, as the normal purpose of loans of this type is to aid in the merchandising of goods. Such loans are made in order that the pur-

chaser of raw materials or merchandise can make prompt payment to his creditor awaiting the sale of his own product and are therefore practically always closely connected with the purchase price of the raw materials or merchandise involved. That is, the loan is obtained by the purchaser so that he can "take his discount" and thus obtain the goods at a lower total cost than would be the case if he accepted the credit terms of the seller. The question as to whether a short-term loan should be obtained usually arises in somewhat this way. X purchases goods from Y at an invoice price of \$1,000.00. A discount of 2 per cent will be allowed if the bill is paid within ten days, but if it is not paid within that time the net must be paid within sixty days. X has not the ready funds to make payment immediately but his credit at the bank is good for a 6 per cent rate per year. He can borrow \$980.00 at 6 per cent from the bank and immediately pay Y for the goods. Then at the end of sixty days he pays the bank the \$980.00 plus interest, \$9.80, or a total of \$989.80. He then says that his goods cost him \$989.80 instead of \$1,000.00 as they would have if he had waited sixty days to pay Y. He has evidently saved \$10.20 by this operation.

It was shown in Chapter VIII that all commercial interest, both interest paid and interest received, can be entered in one account. This account then shows the excess of interest paid on merchandising operations over interest received or *vice versa*, and in the ordinary industrial enterprise this net figure is of more significance than the total of the interest on either notes payable or notes receivable. This account represents the results of operations of a commercial banking character. Interest received on notes receivable might with reason be considered as a deduction from the total interest paid on notes payable. A note received from a customer can be and usually is endorsed and used for obtaining current funds from a bank. If it is held a few days before it is taken to the bank for discount, the interest earned in those few days might properly be taken as an offset to the interest paid on notes originating with the firm. There are certain cases, however, where it would be of service to the manager to separate the accounts so as to show the commercial interest paid in one and the amount received in another, but the two methods of keeping the commercial interest were explained and illustrated

quite fully in Chapter VIII.<sup>1</sup> (At closing dates interest accrued in both directions is, of course, taken into consideration.)

Another question of considerable importance in connection with the Commercial Interest account is whether the account should be closed into expense and revenue or into net revenue accounts. To be logically consistent with the theories thus far developed in this text, interest should be considered as a distribution of net revenue to the equities represented by the Notes Payable account. In the average enterprise a not inconsiderable part of the working capital is supplied through this medium, and this is good policy. Should not interest on these notes then be considered in the same category with interest on bonds as a distribution of net revenue?

There are, however, good practical reasons for charging this form of interest to expense (or crediting it to gross revenue in the case of a credit balance). The borrowing operation as was shown above is directly connected with the price of goods purchased (or sold). By obtaining the loan the purchase price of goods is less even after interest is paid on the loan than it would be if the alternative terms of settlement were accepted. As it is customary to charge the Materials account with the invoice price and to credit a valuation account, Merchandise Discount, for the discounts actually taken, there is some reason for charging interest on commercial loans against the operating accounts. That is, since the whole matter is tied up with the purchase transaction and the merchandise discount, the statements for practical purposes will be as significant with this kind of interest in the expense and revenue statement as through the more logical method of treating it as a distribution of net revenue. The location of such items, in other words, may be based entirely on practical considerations.

In a bank the case is clear; commercial interest is gross revenue. Expenses of conducting the bank are met out of the commercial interest received. The bank organization is maintained primarily for the purpose of furnishing this service and of course expenses incurred in furnishing such services must be deducted from the revenue received from the sale before obtaining net

<sup>1</sup> It is suggested that the student at this point review the section on closing of interest accounts (pages 188-189) in order to have clearly in mind the different elements entering into such an account.

revenue. This does not necessarily mean that the debit on the borrower's books must also be entered in the Expense and Revenue account but it lends considerable weight to that contention.

A consideration of a few of the typical transactions involving commercial interest will lend concreteness to the discussion. The most common case has already been mentioned, namely the borrowing or loaning on an interest bearing promissory note. The X Company borrows \$1,000.00 from a bank on a sixty-day 6 per cent note. On the date of borrowing, the entries are,

Cash . . . . .	\$1,000.00	
Notes Payable . . . . .		\$1,000.00

Then at the end of sixty days, when the note is paid, the entries will be,

Notes Payable . . . . .	\$1,000.00	
Commercial Interest . . . . .	10.00	
Cash . . . . .		\$1,010.00

Another form of borrowing frequently used is through a non-interest bearing note. That is, the X Company brings to the bank its promise to pay \$1,000.00 at the end of sixty days without interest. In this case the payment to be made by X at the end of sixty days is just \$1,000.00 and no more. The bank then will discount this note at the bank rate of discount and give X the proceeds. Six per cent of \$1,000.00 for sixty days is \$10.00. The net proceeds of the note therefore are \$990.00 and the entries on X's books are,

Cash . . . . .	\$990.00	
Discount on Notes Payable . . . . .	10.00	
Notes Payable . . . . .		\$1,000.00

The amount of the discount is, of course, interest but this interest accrues during the ensuing sixty days. As Discount on Notes Payable stands on the books at present it is a valuation account offsetting the overstatement of the liability on notes payable. At the end of sixty days the full \$1,000.00 is paid and the entries would be,

Notes Payable . . . . .	\$1,000.00	
Cash . . . . .		\$1,000.00

By this time the interest of \$10.00 has accrued and should be charged to Commercial Interest,

Commercial Interest . . . . .	\$10.00
Discount on Notes Payable . . . . .	\$10.00

Because of the short time which elapses between the date of issue and date of payment of such a note, it is considered good policy to charge the discount to Commercial Interest at the time the loan is made. In this way the necessity for making this last entry is avoided. If all of the interest on such a note has not accrued at the time of closing the books, the accrued amount can be taken into account through the inventories. Commercial Interest, then, could have been charged originally instead of Discount on Notes Payable. The point to be emphasized, however, is that the interest accrues during the ensuing period.

While interest and discount as they appeared in the last two illustrations are fundamentally the same thing, attention should be called to a difference between the rate of interest and the rate of discount. The rate of interest is applied to the present sum to obtain the amount to be *added* for interest. The rate of discount is applied to the sum due in the future to obtain the amount to be *deducted* for discount. It is obvious that a certain rate of discount would give a higher rate of interest on the present value of a sum. To illustrate, the non-interest bearing note for \$1,000.00 which was discounted at 6 per cent for sixty days brought \$990.00. The item of \$10.00 is interest. The rate of interest involved in the transaction is greater than 6 per cent however, as the interest on \$990.00 at 6 per cent for sixty days is only \$9.90. The borrower then pays a higher rate of interest than the stated rate of discount if he has a non-interest bearing note discounted at the bank. The relation between the two rates is given in a mathematical formula in the next chapter.

Minor questions sometimes arise in matters regarding interest where custom is primarily the guide. In computing interest on short-term notes, for instance, the student may be in doubt as to whether to figure 360 or 365 days to the year. There is no absolute uniformity in practice in this matter but certain customs are general enough in extent to warrant a statement of them in the form of rules. The year is generally taken as 360

days for computations involving the use of odd days. Sixty days, for example, is one-sixth of a year. The note itself, however, may specify that 365 days shall be used as a basis. The next shorter unit of time than the year is the month. The month is always considered to be the period between the dates of equal number including the second number. That is one month from January 15th is February 15th. A note due one month from the former date must be paid on the latter. One month from January 31st, however, is February 28th (or 29th in a leap year). Thirty days and one month are usually considered as synonymous terms although in some cases the actual number of days is counted. In other words, one-twelfth of a year is either thirty days or one month.

Other forms of paper which are classed as notes payable, or notes receivable, are time drafts, trade acceptances, bills of exchange, etc. Each of these forms of paper is somewhat distinctive as to legal form but in accounting all are properly treated as commercial notes. If X sells a bill of goods to Y and then draws a draft on Y which is properly accepted, the draft becomes a promissory note. It is a note payable on Y's books and a note receivable on X's books. The same would be true of other forms of commercial paper of this general character.

An industrial concern may receive a large number of promissory notes from its customers in the ordinary conduct of its business. If these are retained until maturity, the entries would be the reverse of those made on the books of the customer, except that Notes Receivable would be the title of the account representing the notes instead of Notes Payable. The notes are usually obtained, however, in order to use them for immediate discounting purposes. The Notes Receivable account then is credited, Cash debited for the proceeds, and the Commercial Interest account debited if the proceeds are less than the face of the note or credited if the proceeds are more than the face of the note.

#### LONG-TERM SECURITIES

Interest on long-term securities is unquestionably a deduction from net revenue. Such securities are issued for the purpose of raising the capital to be retained permanently in the enterprise,

and accruals of interest are therefore contractual distributions of net revenue. Being contractual it is essential that the accrual on each class of securities be kept in a distinct account. Interest on first mortgage bonds, for example, must be met before any net revenue is apportioned to second mortgage bonds, and interest on these must in turn be met before a further apportionment to the less secured equities such as income bonds, debenture bonds, etc. Interest on each class of security therefore has a significance of its own. Further, interest received from securities owned should not be placed in the same accounts with interest on outstanding securities. The net revenue statement of a corporation having several classes of securities outstanding, for example, might have interest accounts as shown by the following statement.

## NET REVENUE STATEMENT

Interest on First Mtg.		Balance from Expense	
4's	\$585,490	and Revenue	\$2,356,200
Interest on Second Mtg.		Interest on Securities	
5's	495,380	Owned	15,365
Interest on Income			
6's	298,300		
Interest on Debentures			
7's	185,275		
Balance			
(Stockholders' Equity)	807,120		
	<u>\$2,371,565</u>		<u>\$2,371,565</u>

The order of the interest accounts on the debit side is of considerable importance. They should be listed in the order of claims to net revenue as specified in the security contracts. The balance carried from net revenue is available, after taxes have been deducted, for the private equities. Interest on first mortgages must of course be met before the second mortgage bondholders may present their claims, and so on; and in case of a deficiency in net revenue the loss of interest is placed on the security holders whose claims are placed low in the list. This matter can always be definitely settled by an examination of the text of the security contract.

The determination of the amount to be entered in each interest account, however, is not such an easy matter. The fact that 4 per

cent bonds with a par value of \$1,000,000.00 are outstanding and that \$40,000.00 is paid over to the bondholders each year does not necessarily mean that \$40,000.00 should be charged to the appropriate bond interest account. In fact the charge would be equal to the annual payment of bond interest only in cases which rarely exist in actual practice, namely in case the bonds are sold at par. If the \$1,000,000.00 issue of 4 per cent bonds due in twenty years were sold to investors for only \$934,516.19, for example, and this would be the case if the market rate of interest were  $4\frac{1}{2}$  per cent, the interest accrual on the bonds would be greater than \$40,000.00. The detailed explanation of this fact will be deferred to the next chapter where the mathematical computations are given, but the principle involved can perhaps be explained in a few words at this point.

In the preceding section two illustrations of short-time notes were given. In the second one a non-interest bearing note was discounted at a bank. It was said that this discount is in fact interest that accrues in the ensuing period before it becomes due. Now even if the note had been interest bearing as the first one was but the amount of interest were not as much as the market dictated should be given, the note would again be discounted and this discount would be part of the interest. The case of the twenty-year bonds under consideration is analogous to this situation. The main difference is that more time elapses between the date of issue and final payment and that the interest on the bonds is paid periodically throughout the life of the bonds. But the rate of interest stated in the bonds is not as high as the market requires for this type of security; therefore, the security will be discounted and the discount is part of the interest. Further it was stated in the preceding section that after the interest had accrued, the Discount account should be credited and Interest charged, but that inasmuch as the period involved was short, Interest might be charged in the original entry. In the case at hand, however, Discount on Bonds should be credited and Interest on Bonds charged only as the interest accrues, as the interest account cannot be charged directly for the whole discount at the date of issue because the integrity of a great many succeeding net revenue statements is at stake. At the date of issue then entries must be made recognizing this discount.



Cash . . . . .	\$934,516.19	
Discount on Bonds . . . . .	65,483.81	
First Mortgage Bonds . . . . .		\$1,000,000.00

The Discount on Bonds is a valuation account to be written off as the interest actually accrues. During the first six months, the interest accruing would amount to  $2\frac{1}{4}$  per cent of \$934,516.19 (if interest were payable semiannually, see next chapter), or \$21,026.61. At this time bond interest to the amount of \$20,000.00 is paid on this accrual so this payment is short just \$1,026.61. Interest on Bonds is charged with the total accrual, Cash credited with the payment, and Discount on Bonds with the balance.

Interest on Bonds . . . . .	\$21,026.61	
Cash . . . . .		\$20,000.00
Discount on Bonds . . . . .		1,026.61

When this \$1,026.61 is subtracted from \$65,483.81 a balance is left in the valuation account, Discount on Bonds, of only \$64,457.20. The bondholders' net investment then is \$1,000,000.00 less \$64,457.20 or \$935,542.80, and the interest accrual for the next six months is  $2\frac{1}{4}$  per cent of this amount or \$21,049.71. The same form of interest entry would now be made with this amount charged to interest. The total interest for the year then is \$42,076.32 instead of \$40,000.00, the amount of the payments. Continuing this policy for the twenty years the Interest on Bonds account for each period would be charged with its due share of interest and the Discount on Bonds account closed.

On the other hand if the \$1,000,000.00 of bonds had carried a 5 per cent rate and were sold to investors on a  $4\frac{1}{4}$  per cent market basis, the price would be \$1,065,483.81. The bonds are said to be sold at a premium of \$65,483.81. This premium is simply part of the investment which is returned in the bond interest payments. In this case, that is, the interest charge for each year would be less than \$50,000.00, the amount of the payment. The corporation pays \$50,000.00 each year, but this is more than the market demands in the form of interest, therefore the investor makes a payment at the date of issue for the privilege of receiving these additional sums. The corporation at the date of issue makes these entries,

Cash . . . . .	\$1,065,483.81	
First Mortgage Bonds . . . . .		\$1,000,000.00
Premium on Bonds . . . . .		65,483.81

The Premium on Bonds account represents part of the bondholder's equity and will remain on the books until written down at subsequent interest payment dates. At the end of six months, the interest accrual on the market rate is  $2\frac{1}{4}$  per cent of the original investment, \$1,065,483.81, or \$23,973.39. But the corporation actually pays \$25,000.00 in bond interest. The difference between these two quantities is a return of part of the original investment originally credited to Premium on Bonds. The entries are,

Interest on Bonds . . . . .	\$23,973.39	
Premium on Bonds . . . . .	1,026.61	
Cash . . . . .		\$25,000.00

The investment now remaining in the bonds is only \$1,064,457.20 and it is on this figure that interest really accrues at  $2\frac{1}{4}$  per cent for the next six months. This accrual amounts to \$23,950.29 and the payment of \$25,000.00 leaves \$1,049.71 as another return of premium. The total interest charge for the year, therefore, is \$47,923.68 instead of \$50,000.00, the cash payment. The continued use of this method for the twenty years would reduce the Premium on Bonds account to zero and would charge the proper amount of interest against each year's net revenue statement.

Accumulation of discount and amortization of premium tables may easily be prepared to serve as a basis for the interest entries for bonds at a discount or premium respectively. In the next chapter a rather detailed explanation of such tables is given together with the necessary mathematical formulæ for bond valuations. The purpose of raising the question at this point is to show the necessity for making an accurate computation of the interest item. Obviously an error in stating the accrual of interest on one class of security in the net revenue statement might cause an unjust distribution to other classes of security holders. Many complicated computations arise in placing the proper figure in the interest accounts, but the security contracts must be carefully investigated together with the quoted

price as affected by the market conditions. With these facts at hand, proper entries can be made with the aid of mathematical computations or various interest tables based upon the same.

#### INTEREST IN VALUATIONS

The fact that interest enters into every transaction where time is an element is of particular significance in the valuation of the fixed assets. Ideally there is a rather definite relation between the revenue attributable to an asset item and the value of that item at any time. In fact if the revenue is definitely known or can with any degree of accuracy be estimated, the valuation of the asset even for sale purposes is obtained by a discounting process. On the other hand where there is no reasonable basis for estimating the future revenues obtainable, interest is a factor which must be taken into account on the production side. That is, interest always enters into the situation though sometimes the computation is made by looking at the revenues and applying a discounting process, while at other times the computation is made by looking at the cost or investment side and applying the interest computation to that figure. It is partially because of these different ways of looking at the asset items that it is convenient to classify the fixed assets into the ordinary intangible items, tangible items, and claims against others (securities). A brief statement of the way in which interest enters into the valuation of each of these classes of assets will be made in this section, and a more detailed discussion of each class will be found in later chapters.

The valuation of securities owned presents the simplest case as the purchaser of a security consciously makes his bid on the basis of the amounts to be received in the future. The future sums due are all definitely stated in the security contract (except in the case of capital stock) and the market rate of interest then determines the purchase price. The reason that a \$1,000.00, twenty-year, 4 per cent bond is purchased for \$934.52, is that if the market rate of interest is  $4\frac{1}{2}$  per cent this sum is the discounted value of all the amounts which the bond entitles the purchaser to obtain. The entries which are made on the issuing company's books covering such situations were illustrated in

the preceding section, and the purchaser of the bond is simply looking at the same transaction from another point of view. In his case the bond is an asset and the interest actually accruing on the bond is a credit to net revenue. For example, at the time of acquiring the bond just mentioned, the purchaser would make these entries,

Bonds Owned <sup>1</sup>	\$934.52
Cash	\$934.52

At the end of six months when the \$20.00 bond interest payment is received a revaluation of the bond should be made. The holder now owns a  $19\frac{1}{2}$  year bond and if the market rate is still  $4\frac{1}{2}$  per cent this will give a value of \$935.54. The journal entries are,

Bonds Owned	\$ 1.02
Cash	20.00
Interest on Bonds Owned	\$21.02

The interest earning consists of an increment in the value of the bond owned of \$1.02 plus the \$20.00 cash received from the corporation. If the bond had decreased in value instead of increasing the entries would have shown credits to the Bonds Owned account and to Interest equal to the debit to Cash. Changes in value either way are caused by a change in the present value of the sums due in the future. In Chapter XVIII the details of the valuation of securities on the books of the purchaser are explained. Enough has been said here to show that in the case of securities owned interest is an important factor in valuation, and to show the necessity for a knowledge of the mathematics of interest calculations in this connection.

In the valuation of the general class of intangible assets such as goodwill, franchises, patents, leases, etc., the discounting process is used. In some of these cases the amounts of revenue to be received due to the existence of the property right are definitely known. The valuation in such cases follows the same procedure as for securities. The value of the lease-hold which brings

<sup>1</sup> There is something to be said in favor of listing the bonds owned in this account at par and using a valuation account *Discount on Bonds Owned* as an offset. For the purpose of this illustration, however, the net valuation may properly be carried into the Bonds Owned account.

in \$10,000.00 per year but which expires at the end of fifteen years is, if the market rate of interest for such an investment is 6 per cent, \$97,122.49. This figure represents the discounted value of the fifteen payments of \$10,000.00 each on a 6 per cent interest basis. Further this would be the sale price if it were placed on the market with the buyer and seller having the same information. In the case of other intangibles where the definite amount of revenue to be obtained is unknown, the revenue items are estimated. In the valuation of goodwill, for example, a judgment is made of the amount of revenue attributable to this factor and the number of years it will be effective. With this estimate as a basis, the value is obtained through the discounting process. The same may be said of franchise values and of all intangibles when the revenue is fixed by contract or otherwise definitely known.

There are many practical questions which arise in the valuation of intangibles, and which must be settled before the discount process is employed, and these will be taken up quite fully in Chapter XXIV. In all these cases, however, after the revenue figures have been obtained, either by definite contract or estimate, the interest calculation is the final determining factor.

In the case of tangible assets, the case for interest is not quite so clear. Here it may be said with reason that the original valuation at the date of purchase at least is not immediately dependent upon the revenue attributable to the item. The manager of a factory decides that in view of the conditions in his plant, the labor market and all other factors to be considered, it would pay him to invest in a certain machine. He pays just \$15,000.00 for the machine desired, not because that figure represents the present value of the revenues attributable to the machine but because the market price of that machine at that time is \$15,000.00. He might be willing to pay more but this is unnecessary so long as it can be obtained on the market for that price. Of course, he would have convinced himself that the machine was capable of aiding sufficiently in the production of his product to yield a net return at least equal to the market rate of interest in addition to replacing the original investment, but the final definite basis for the original valuation in each individual purchase is the market price of the item purchased.

Here the asset is being viewed from a different standpoint than that applicable to intangibles. Cost, or at least the market price of the specific item as viewed from the cost side, seems to be decisive. How then does the interest problem enter into this situation? This is a much mooted question in connection with valuation in general and requires some care in answering.

One purpose in revaluing physical property items is, as it is for any asset, to restate the book value and make it correspond to the present value. Now in the assets comprising the other classes, *i.e.* intangibles and securities, the market can be relied upon to furnish the information. That is, a rather definite figure can be obtained for valuation purposes on the basis of market information. This figure is obtained, as was stated in the discussion above, through the use of the market rate of interest in discounting revenues which are known.

The market is not available, however, for this purpose in the revaluation of the ordinary tangible assets. The revenues are uncertain to say the least and a discounting process cannot be used. Since cost is the basis of the original valuation, it is but natural to expect future valuations of the same asset to be in some way based on cost, but the market cannot be relied upon here, either, as there is no market for second-hand machinery, buildings, and the like which can be used for valuing such items in use. The estimate or appraisal of the engineer is, therefore, substituted for the market test, and this practice has given rise to the basis of valuation on cost of reproduction less depreciation or, in some cases, original cost less depreciation. That is, a judgment as to cost and accrued depreciation is substituted for a market test.

The judgment of the engineer or of the manager cannot be relied upon to furnish accurate measurements of depreciation on the basis of inspection or mere physical measurement. A pair of calipers cannot be used for measuring the extent to which a machine which is still being operated in its entirety has depreciated. Physical measurements can be used for revising estimates of the probable service life, but value expiration cannot be obtained in such a way. The only way left open for making such revaluations is by spreading the depreciation charge in the expense accounts over the life of the property item. At any time

the book value is the difference between the original cost and the amount charged to expense for depreciation.

It is not the purpose of this chapter to discuss the methods of measuring depreciation and the resultant valuing of tangible property on this basis. This question is discussed in Chapter XXIII. Enough will have been said here by mentioning the fact that in the more approved methods of accounting for depreciation interest is usually considered as a factor. At least in the sinking fund, compound interest, and annuity methods, interest is indeed one of the most important factors. These methods all recognize to some extent at least that interest is an element which must be shown in the accounts wherever a durable property item is used. The methods by which this factor is brought into the calculation are highly technical and hence cannot be discussed without a considerable knowledge of interest computations such as are given in the next chapter.

Finally, it may be said, in summarizing this discussion, that interest calculations enter into the accounting computations at some point or other in every case where time is an important element in the process of production. In some cases it enters as an explicit payment for the service rendered based on contract. In other cases there is no explicit recognition by contract but it is involved in a discounting process. Again it may enter as an addition to or adjustment of cost figures for purposes of valuation. In fact so important is the question that the next chapter will be given over entirely to the technical computations which commonly present themselves.

## XVI

### INTEREST CALCULATIONS

THERE are several reasons for a rather detailed discussion of the formulæ which are most frequently needed in the solution of accounting problems involving interest. It cannot safely be assumed that the student of accounting either remembers or understands the fundamental interest situations treated in the ordinary arithmetic. Moreover interest computations may be very complicated, as in the case of the determination of principal and interest in connection with such securities as bonds; and the accountant who is to be thoroughly at home in dealing with theories must be thoroughly competent to deal with the mathematical principles involved.

Bond interest payments, annuity installments, sinking fund contributions, and many other similar items can be properly entered in the accounts only on the basis of mathematical computations. Similarly, as was stated in the last chapter, interest calculations are necessary in connection with the valuation of certain classes of property such as leases, patents, and other wasting assets and are involved in certain general methods of estimating depreciation. The fact that these situations arise is therefore ample justification for a rather lengthy discussion of the mathematics of interest computations. In fact so important are these calculations that it has seemed best to defer to the next two chapters the discussion of purely accounting aspects of the situations involving the use of these formulæ in order that this chapter might be confined to the explicit mathematics of interest.

#### THE ACCUMULATION OF PRINCIPAL

Perhaps the computation used most frequently in business transactions is that of determining the amount to which a principal will accumulate in a given period at a certain rate of interest. While most of such computations are made at compound



interest rates, the fact that occasionally a contract is made at the simple rate makes necessary an analysis of the two kinds of computations. At the risk of attempting to explain the obvious, therefore, the following elementary definitions are given as a basis for the discussion in this and succeeding sections of the present chapter.

The unit of time used in interest calculations is the *year*. The total interest accruing on one unit of principal (the *dollar*) in one year is the *rate of interest*. *Compound* interest results from adding interest to the principal at stated intervals, and allowing interest to accrue on the sum for the succeeding periods. *Simple* interest accrues if no interest is added to the principal in this manner. The number of periods per year at which interest is added to the principal for compounding is called the *frequency of conversion*.

If a principal of \$100.00 were invested at 6 per cent simple interest for five years, it would accumulate according to definition as shown by the following table.

(1) YEAR	(2) PRINCIPAL ON WHICH INTEREST IS COMPUTED	(3) INTEREST DURING YEAR	(4) SUM AT END OF YEAR
1	\$100.00	\$6.00	\$106.00
2	100.00	6.00	112.00
3	100.00	6.00	118.00
4	100.00	6.00	124.00
5	100.00	6.00	130.00

The total interest for the five years is five times the interest for one year or \$30.00. A formula may easily be developed on the basis of such a schedule. Using the symbol  $P$  to represent the principal;  $S$ , the sum to which the principal will accumulate;  $i$ , the rate of interest; and  $n$ , the number of years; the following equation is evidently true,

$$S = P + Pni$$

or,

(1)<sup>1</sup>

$$S = P(1 + ni)$$

<sup>1</sup> The more important formulæ will be numbered in order that reference may easily be made to them.

This is the standard equation for the accumulation of a principal at simple interest.

Thus, in the above illustration,  $P$  is \$100.00;  $n$ , 5; and  $i$ , .06 (or 6 per cent). The substitution of these quantities in formula (1) gives the following,

$$\begin{aligned} S &= 100(1 + .30) \\ &= 130.00 \end{aligned}$$

If, now, a principal of \$100.00 were invested at 6 per cent compound interest convertible annually, the corresponding amounts would be as follows :

(1) YEAR	(2) PRINCIPAL ON WHICH INTEREST IS COMPUTED	(3) INTEREST DURING YEAR	(4) SUM AT END OF YEAR
1	\$100.00	\$6.00	\$106.00
2	106.00	6.36	112.36
3	112.36	6.74	119.10
4	119.10	7.15	126.25
5	126.25	7.57	133.82

The formula which expresses the accumulation for one year is the same in this case as for simple interest because the compounding process is not performed until the end of the first year. Therefore the formula for the first year is  $S = P(1 + i)$  (from formula (1) when  $n$  is 1). Now the sum for the second year is obtained in a like manner except that the principal at the beginning of this year is the sum from the preceding year. Then  $S = P(1 + i)(1 + i) = P(1 + i)^2$ . Again, the sum at the end of the third year would be equivalent to  $P(1 + i)^2(1 + i)$ , or  $P(1 + i)^3$ . Generalizing from this reasoning it may easily be seen that the sum to which the principal  $P$  would accumulate in  $n$  years would be expressed by the formula,

$$(2) \quad S = P(1 + i)^n$$

This formula may be used for finding the amount to which a principal will accumulate in any number of years at a given rate.

of interest, convertible annually. Thus, in the illustration just given, the principal ( $P$ ) is 100, the interest ( $i$ ) is .06, and the number of years ( $n$ ) is 5. Substituting these figures in equation (2) gives,

$$\begin{aligned} S &= 100(1.06)^5 \\ &= 133.82 \end{aligned}$$

which is the same result as shown by the table.

The term  $(1 + i)^n$  in the right-hand member of equation (2) expresses the accumulation of one dollar at rate  $i$  for  $n$  years. This can be shown very clearly by assuming that the principal ( $P$ ) is one. The formula then becomes,

$$(3) \qquad S = (1 + i)^n$$

Now this expression contains but two variables,  $i$  and  $n$ , which makes it very convenient to construct a table for values of  $S$ . Such a table is of a great deal of service in finding the accumulation of principal sums since the  $S$  in equation (3) multiplied by the principal gives the value of  $S$  in equation (2). For an illustration of such a table see Table I in Appendix B. Here the different rates of interest are shown at the heads of the various columns while the numbers of years are shown in the columns at the sides of the page. Thus to find the accumulation of one dollar at 6 per cent convertible annually for five years refer to the column headed "6 %" and opposite the figure 5 in the column headed " $n$ ." The required quantity is 1.3382256, the value of  $S$  in equation (3) for the conditions assumed. Now if the principal were \$100.00, the sum could be found by substituting for  $(1 + i)^n$  in formula (2), the quantity found in the table.

$$\begin{aligned} S &= 100(1.3382256) \\ &= 133.82 \end{aligned}$$

This result is identical with the accumulations shown in the two preceding computations. The saving in computation effected through the use of the interest tables is evident. Of course whenever a computation involves a rate of interest not given in the tables equation (2) must be solved in detail.

Interest is compounded more frequently than once a year in a great many transactions. The accumulation of a principal in

such cases is illustrated in the following table which shows the accumulation of \$100.00 for five years at 6 per cent, interest convertible semiannually.

(1) PERIOD	(2) PRINCIPAL AT BEGIN- NING OF PERIOD	(3) INTEREST DURING PERIOD	(4) SUM AT END OF PERIOD
1	\$100.00	\$3.00	\$103.00
2	103.00	3.09	106.09
3	106.09	3.18	109.27
4	109.27	3.28	112.55
5	112.55	3.38	115.93
6	115.93	3.48	119.41
7	119.41	3.58	122.99
8	122.99	3.69	126.68
9	126.68	3.80	130.48
10	130.48	3.91	134.39

It is evident from this table that if the half-year period is taken as the unit of time, the rate per period as the interest rate, and the number of periods as twice the number of years, in place of the year, rate per year, and number of years respectively, the sum accumulates in conformity with equation (2). If the stated annual rate is represented by  $j$ , and the frequency of conversion by  $m$ , then the rate per period would be  $j/m$ , and the number of periods,  $mn$ . The formula for the accumulation in this case would therefore be,

$$(4) \quad S = P(1 + j/m)^{mn}$$

To illustrate the use of this equation, consider the principal as \$100.00, the nominal rate of interest as 6 per cent convertible semiannually, and the period of accumulation as five years. The substitution of these quantities in equation (4) gives the following,

$$\begin{aligned} S &= 100 \left( 1 + \frac{.06}{2} \right)^{10} \\ &= 134.39, \end{aligned}$$

the same result as was obtained in the table shown above.

Table I in Appendix B can also be used as an aid in solving

equation (4). This is evident by an inspection of the term  $(1 + j/m)^{mn}$ , which is the same in form as the term  $(1 + i)^n$  in equation (3). Thus when the nominal rate is 6 per cent convertible semiannually for five years, the expression  $(1 + j/m)^{mn}$  becomes  $(1 + .03)^{10}$ . Now for convenience in computation, 3 per cent can be considered as the rate and that column referred to in the table. Further, 10 can be considered as the number of periods as shown in the column headed "*n*." The amount opposite 10 in the 3 per cent column, 1.3439164, is the value of the expression  $(1 + j/m)^{mn}$  in the case assumed. This quantity substituted in the original equation gives,

$$\begin{aligned} S &= 100(1.3439164) \\ &= 134.39 \end{aligned}$$

When interest is converted more frequently than once a year, the stated rate without compounding is called the *nominal* rate, while the rate actually realized in one year is called the *effective* rate of interest. In the illustration above, for example, the nominal rate is 6 per cent convertible semiannually. The effective rate may readily be found by dividing the total interest accruing in the year, \$6.09, by the principal at the beginning, \$100.00, which gives 6.09 per cent. A mathematical expression for the relation between the effective and nominal rates may easily be obtained from the definition given. Thus the amount to which one dollar will accumulate in one year at the nominal rate *j* is  $(1 + j/m)^m$ . The total interest earned is  $(1 + j/m)^m - 1$ . But the total interest on one dollar in one year is the effective rate, therefore,

$$(5) \quad i = (1 + j/m)^m - 1$$

In the problem just given, where the nominal rate was 6 per cent convertible semiannually, the effective rate may be found by this formula,

$$\begin{aligned} i &= \left(1 + \frac{.06}{2}\right)^2 - 1 \\ &= .0609 \text{ or } 6.09\% \end{aligned}$$

The converse of this problem, that is the determination of the nominal rate which will produce a given effective rate, may be solved from formula (5). In this case *i* and *m* are known, but *j*

is the quantity to be found. Solving equation (5) for  $j$ , the result is,

$$(6) \quad j = m \{(1 + i)^{1/m} - 1\}$$

Thus if it is desired to extend a loan at an effective rate of 6 per cent, and the interest is to be converted semiannually, the nominal rate which should be employed may be found from equation (6).

$$j = 2 \{(1.06)^{1/2} - 1\} = 5.96 \%$$

#### THE PRESENT VALUE OF A FUTURE SUM

In the preceding section, formulæ were developed which express the accumulation of a principal at simple interest, at compound interest convertible annually, and at compound interest convertible  $m$  times a year. The converse of each of these problems very frequently arises in commercial practice. Stated in general terms the problem is to find the present value of a definite sum known to be due at a definite date in the future. Such a sum may be discounted with the use of a discount rate or with an interest rate, either of which computations gives a different result. To bring out the points of difference, both methods will be illustrated in this section.

When a deduction is made from a sum due at a future date to determine the present value, the amount deducted is called *discount*, and the process is called *discounting*. The amount deducted is in fact interest, however, and this fact should be kept clearly in mind. The difference between the present value and the future sum is interest even though the computation is made on the basis of a future sum. Viewed either from the standpoint of the borrower or the lender, discount may be defined as the consideration for the use of the present value (principal). The total discount on one dollar of the sum due in one year is the *rate of discount*.

The formula for finding the present value of a future sum at simple discount may be developed directly from the definition. Thus, if  $P$  represents the present value,  $S$ , the sum due,  $n$ , the number of years, and  $d$ , the rate of discount, then

$$(7) \quad \begin{aligned} P &= S - Snd \quad \text{or} \\ P &= S(1 - nd) \end{aligned}$$

For example, if a sum of \$100.00 due in five years were discounted at the rate of 6 per cent simple discount, the present value would be  $\$100(1 - .30)$  or \$70.00. The rate of simple discount is commonly used in banking transactions for short-time loans, such as thirty, sixty and ninety-day paper; but it is very seldom used for transactions covering a period of more than one year.

Compound discount is only of theoretical interest as it would practically never be used in actual practice. The reason for this is evident. In compound discount the discount is deducted from the sum due at stated intervals and the rate is applied to the remaining sum; and since the rate would be applied to a continually decreasing sum this would result in a smaller total discount than would be found by the application of the simple rate. The total interest involved in the transaction would therefore be less with compound than with simple discount. This may be made still more evident by reference to the following table which shows the compound discount on a sum of \$100.00 due in five years at 6 per cent discount, convertible annually.

(1) YEAR	(2) SUM DUE AT END OF YEAR	(3) DISCOUNT FOR YEAR	(4) PRESENT VALUE AT BEGINNING OF YEAR
5	\$100.00	\$6.00	\$94.00
4	94.00	5.64	88.36
3	88.36	5.30	83.06
2	83.06	4.98	78.08
1	78.08	4.68	73.40

The present value of the sum in this case is \$73.40 as compared with \$70.00 when the simple rate is used.

The equation for compound discount may be developed directly on the basis of the table shown above. Using the same symbols as before, the present value at the beginning of the  $n$ th year would be, by equation (7),  $P = S(1 - d)$ . The present value at the beginning of the year  $(n - 1)$  would be found in the same manner (substituting  $S(1 - d)$  for  $S$  in formula (7)) to be,

$$P = S(1 - d)(1 - d) = S(1 - d)^2$$

At the beginning of the year ( $n - 2$ ) the present value would be,  $S(1 - d)^3$ , found in the same manner. The formula for the present value at the beginning of the *first* year would therefore be,

$$(8) \quad P = S(1 - d)^n$$

Substituting the quantities from the table above,

$$\begin{aligned} P &= 100(1 - .06)^5 \\ &= 73.40 \end{aligned}$$

Instead of applying the compound rate of discount to a sum due, it is customary to discount the sum at a given rate of interest. The question asked in such cases is, "what present sum will accumulate at a given rate of interest to the sum due in the future?" When this question is asked the sum in the future is known and so is the rate of interest to be realized, but the present value is unknown. That there is a relation between the rates of discount and interest which is capable of mathematical expression is evident. The total discount on the sum due is the total interest on the present value, but the rate of discount in a given case is not equal to the rate of interest. For example, if \$100.00 due one year from date were discounted at 6 per cent, the discount would be \$6.00, and the present value, \$94.00. The difference between the present value and the sum due is interest. Considering the present value, \$94.00, as the principal now, and \$6.00 as the interest, the rate of interest is obviously  $6/94$  or 6.38 per cent. In other words, a 6 per cent rate of discount produces a 6.38 per cent rate of interest on the present value.

The relation between the rates of discount and interest in a given transaction is of sufficient importance to be expressed in equation form. The problem may be stated in this form, what rate of discount applied to a sum due will produce such a present value that a given rate of interest will be realized on the present value? Equations (2) and (8) may be solved as simultaneous equations for this problem, since by hypothesis the terms  $P$  and  $S$  must be the same in each case. Therefore, from equation (2),

$$S/P = (1 + i)^n \text{ and, from equation (8), } S/P = \frac{1}{(1 - d)^n}. \text{ Then}$$



$(1 + i)^n = \frac{1}{(1 - d)^n}$ , and solving this gives,

$$(9) \quad d = 1 - \frac{1}{1 + i}$$

If it is desired to determine the compound rate of discount which, when applied to a sum due, will produce a 6 per cent rate of interest convertible annually on the present value, this equation is of service, for example,

$$\begin{aligned} d &= 1 - \frac{1}{1 + .06} \\ &= .0566 \text{ or } 5.66 \% \end{aligned}$$

On the other hand if the rate of discount applied to a sum due is 6 per cent, and it is desired to find the rate of interest realized, equation (9) can be solved for  $i$  and the substitutions made.

$$\begin{aligned} (10) \quad i &= \frac{1}{1 - d} - 1 \\ &= \frac{1}{1 - .06} - 1 \\ &= .0638 \text{ or } 6.38 \% \end{aligned}$$

Equation (9) is by far the more important for practical purposes. A sum may be discounted very readily at a given rate of interest by use of this formula. Thus if the value of  $d$  in this formula is substituted for  $d$  in formula (8),

$$P = S \left\{ 1 - \left( 1 - \frac{1}{1 + i} \right) \right\}^n$$

which, when simplified, becomes,

$$(11) \quad P = S \frac{1}{(1 + i)^n}$$

To illustrate, if a sum of \$100.00 due in five years is discounted in order to realize a 6 per cent rate of interest convertible annually on the present value, then from equation (11),

$$\begin{aligned} P &= 100 \frac{1}{(1 + .06)^5} \\ &= 74.73 \end{aligned}$$

That is, if \$74.73 were invested to-day and \$100.00 were received in return at the end of five years, the investor would realize 6 per cent interest convertible annually on his investment.

Referring once more to formula (11), it may be seen that when the sum  $S$  is 1, the equation becomes,

$$(12) \quad P = \frac{1}{(1 + i)^n}$$

The right-hand side of this equation is the reciprocal of the right side of formula (3). In other words, the present value of one dollar in  $n$  years at rate  $i$  is the reciprocal of the accumulation of one dollar at rate  $i$  for  $n$  years. If a table of values for formula (3) is available, the corresponding value for formula (12) may be found by the process of simple division. Table II in Appendix B gives the values of  $P$  in equation (12) for several different rates of interest and for periods ranging from one to fifty. The use of this table may be conveniently illustrated by assuming that it is desired to find the present value of \$100.00 due in five years at 6 per cent interest convertible annually. Referring to the column headed 6 per cent, the quantity .7472582 is found opposite the fifth period. This is the present value of \$1.00 due in five years, and the present value of \$100.00 is of course one hundred times this quantity, or \$74.73. Or the result may be found by substituting the quantity found in the table in formula (11).

$$\begin{aligned} P &= 100(.7472582) \\ &= 74.73 \end{aligned}$$

Formula (11) gives the present value when interest is convertible annually. In order to find an equation to express the present value when interest is converted more frequently than once each year, it is only necessary to substitute for  $i$  in this equation its equivalent in terms of  $j$  and  $m$  from formula (5). This gives,

$$(13) \quad P = S \frac{1}{(1 + j/m)^{mn}}$$

Thus if the \$100.00 sum mentioned in the preceding illustration were discounted at the nominal rate of 6 per cent convertible semi-annually, the present value could be found from the equation,

$$P = 100 \frac{1}{(1 + .06/2)^{10}}$$

The last term in this expression can be found in Table II in the 3 per cent column opposite the tenth period (.7440939). Therefore,

$$\begin{aligned} P &= 100(.7440939) \\ &= 74.41 \end{aligned}$$

If a sum of \$74.41 were placed in a fund to accumulate at 6 per cent, convertible semiannually for five years, it would amount to \$100.00 at the end of the period.

#### THE ACCUMULATION OF AN ANNUITY

In the section before last, formulæ were developed which express the accumulation of a principal at compound interest. It is the purpose in this section to present the formulæ for expressing the accumulation of an annuity. An annuity may be defined as a series of payments made at equal intervals during a length of time specified by contract. Each payment, for the purposes of the immediate problem, may be considered as a principal which accumulates at the given rate of interest to the end of the life of the annuity. Each payment will, therefore, accumulate in conformity with the equation for the accumulation of a principal sum. For example, if an annuity of \$100.00 per year payable at the end of each year accumulates at the rate of 6 per cent convertible annually for five years, to what sum does it accumulate? The following table shows the situation and gives the answer to the question.

YEAR	PAYMENT AT END OF YEAR	ACCUMULATION TO END OF 5TH YEAR
1	\$100.00	\$126.25
2	100.00	119.10
3	100.00	112.36
4	100.00	106.00
5	100.00	100.00
Total Accumulation . . . . .		\$563.71

The first payment of \$100.00 made at the end of the first year will accumulate for four years at 6 per cent convertible annually. This, by formula (2), would be,  $S = 100(1 + i)^4 = \$126.25$ . The second payment likewise would accumulate for three years,  $S = 100(1 + i)^3 = \$119.10$ ; the third payment for two years,  $S = 100(1 + i)^2 = \$112.36$ ; the fourth for one year,  $S = 100(1 + i) = \$106.00$ ; and the fifth does not accumulate as it is paid at the end of the period. The whole annuity will accumulate to the sum of these quantities or \$563.71.

A general formula for the accumulation of an annuity may readily be developed from the preceding discussion. If  $S_n$  represents the sum to which the annuity will accumulate in  $n$  years at rate  $i$ , convertible annually, and  $R$  the annuity payment, then  $S_n = R(1 + i)^{n-1} + R(1 + i)^{n-2} + R(1 + i)^{n-3} \dots R(1 + i) + R = R\{(1 + i)^{n-1} + (1 + i)^{n-2} + (1 + i)^{n-3} + \dots + (1 + i) + 1\}$ . The expression inside the brackets on the right side of this equation is a geometrical series which may be summed to the expression,

$$\frac{(1 + i)^n - 1}{i}$$

Therefore :

$$(14) \quad S_n = R \frac{(1 + i)^n - 1}{i}$$

The use of this equation will be evident if instead of using the table of accumulations in the illustration immediately preceding, use be made of formula (14).

$$\begin{aligned} S_n &= 100 \left( \frac{(1 + .06)^5 - 1}{.06} \right) \\ &= 563.71 \end{aligned}$$

In case the annuity payment is one dollar,  $R$  in formula (14) is 1, and for convenience the equation may be written in this form,

$$(15) \quad s_n = \frac{(1 + i)^n - 1}{i}$$

This equation expresses the accumulation of one dollar per year for  $n$  years at the rate  $i$  convertible annually. An interesting observation may be made in regard to the term on the right-hand

side. The numerator is the total interest on one dollar for  $n$  years and the denominator is the rate of interest. The equation may be solved by finding the amount to which one dollar will accumulate to the end of the period, subtracting 1, and dividing by the rate of interest.

Since there are but two variables in this expression, moreover, the values of  $S_n$  for different rates of interest and periods of time may conveniently be arranged in tabular form. This is what is done in Table III of Appendix B. This table is of service in finding the accumulation of annuities similar to the one already used in the illustration above. In Table III in the column headed 6 per cent the amount for five periods is 5.6370930. This amount substituted in equation (14) gives,

$$\begin{aligned} S_n &= 100(5.6370930) \\ &= 563.71 \end{aligned}$$

Another kind of case arises when the annuity payments are made in installments more frequently than once a year and interest is convertible the same number of times per year. For example, if the annuity just mentioned in the preceding illustration were payable in semiannual installments and the rate were 6 per cent convertible semiannually, what would be the sum accumulated? It may readily be seen that the result would be the same as though an annuity of \$50.00 per year were accumulated for ten years at 3 per cent convertible annually. This fact may be expressed in the following formula,

$$\begin{aligned} (16) \quad S_{mn} &= \frac{R}{m} \left\{ \frac{(1 + j/m)^{mn} - 1}{(j/m)} \right\} \\ &= \frac{100}{2} \left\{ \frac{(1 + .03)^{10} - 1}{.03} \right\} \end{aligned}$$

The value of the term in the brackets may be found in the column headed 3 per cent, opposite the tenth period in Table III. This amount, 11.4638793, substituted in the equation gives,

$$\begin{aligned} S_{mn} &= 50(11.4638793) \\ &= 573.19 \end{aligned}$$

Formula (16) is merely a restatement of (14), the period being

changed from the year to  $1/m$ th part of a year, and the rate of interest to the rate per period.

A different case arises when the payments are made at the end of each year but the interest is converted  $m$  times per year. For example, if \$100.00 is placed in a fund at the end of each year for five years, but the interest is converted semiannually, what would be the accumulation? The following table illustrates the situation.

END OF YEAR	PAYMENT TO FUND	EXPRESSION FOR ACCUMULATION TO THE END OF 5TH YEAR	ACCUMULATION AT 6% CONVERTIBLE SEMI-ANNUALLY
1	\$100.00	$100(1 + j/m)^8$	\$126.68
2	100.00	$100(1 + j/m)^6$	119.41
3	100.00	$100(1 + j/m)^4$	112.54
4	100.00	$100(1 + j/m)^2$	106.09
5	100.00		100.00
Total			\$564.72

An equation to express the general case of this type may be developed by substituting for  $i$  in equation (14) its equivalent in terms of  $j$  and  $m$  from equation (5). This gives,

$$(17) \quad S_n^{(m)} = R \left\{ \frac{(1 + j/m)^{mn} - 1}{(1 + j/m)^m - 1} \right\}$$

A table could be prepared for the expression in the brackets but as this problem does not frequently arise in accounting practice one has not been included in this text. Table I can be used, however, to aid in its solution. The term  $(1 + j/m)^{mn}$  in the numerator and the term  $(1 + j/m)^m$  in the denominator can both be obtained from this table. In the illustration just given, for example, the numerator would be,

$$(1 + .03)^{10} - 1 = 1.3439164 - 1$$

and the denominator,

$$(1 + .03)^2 - 1 = 1.0609 - 1$$

Dividing the numerator by the denominator, the result is:

$$.3439164 \div .0609 = 5.64722$$

Substituting this quantity in equation (17) the result is,

$$\begin{aligned} S_n^{(m)} &= 100(5.64722) \\ &= 564.72 \end{aligned}$$

There is still one further possibility which should be discussed in this section. The annuity payments might be made at certain intervals throughout the year and the interest compounded at different periods. Suppose for example that an annuity of \$100.00 per year is payable in four equal installments but that interest is converted but twice a year at the nominal rate of 6 per cent. This case may be placed in tabular form as follows :

PERIOD	PAYMENT	EXPRESSION FOR ACCUMULATION TO END OF 5TH YEAR	ACCUMULATION AMOUNT AT END OF 5TH YEAR
1	\$25	$25(1+.03)^{9\frac{1}{2}}$	\$33.10
2	25	$25(1+.03)^9$	32.62
3	25	$25(1+.03)^{8\frac{1}{2}}$	32.14
4	25	$25(1+.03)^8$	31.67
5	25	$25(1+.03)^{7\frac{1}{2}}$	31.20
6	25	$25(1+.03)^7$	30.74
7	25	$25(1+.03)^{6\frac{1}{2}}$	30.29
8	25	$25(1+.03)^6$	29.85
9	25	$25(1+.03)^{5\frac{1}{2}}$	29.41
10	25	$25(1+.03)^5$	28.98
11	25	$25(1+.03)^{4\frac{1}{2}}$	28.56
12	25	$25(1+.03)^4$	28.14
13	25	$25(1+.03)^{3\frac{1}{2}}$	27.72
14	25	$25(1+.03)^3$	27.32
15	25	$25(1+.03)^{2\frac{1}{2}}$	26.92
16	25	$25(1+.03)^2$	26.52
17	25	$25(1+.03)^{1\frac{1}{2}}$	26.13
18	25	$25(1+.03)^1$	25.75
19	25	$25(1+.03)^{\frac{1}{2}}$	25.37
20	25		25.00
Total . . . . .			\$577.43

The first payment is made at the end of three months and accumulates for four and three-fourths years. As this principal will accumulate in accordance with formula (4) where  $n$  is  $4\frac{3}{4}$  and  $m$  is 2, the exponent is therefore  $9\frac{1}{2}$ . As the second payment

at the end of six months accumulates for four and one-half years, the exponent is 9. The accumulation of the whole annuity is the total of the sums of each one of the payments as shown by these expressions. The only new complication here is the use of fractional exponents, and the computation can be abbreviated through the use of logarithms.

A general equation covering this case can be developed through the summation formula for geometrical series. If the symbol  $p$  represents the number of payments made per year, and all other symbols are used as before, then

$$S_n^{(p)} = R\{(1 + j/m)^{m(n-1/p)} + (1 + j/m)^{m(n-2/p)} + (1 + j/m)^{m(n-3/p)} + \dots + (1 + j/m)^{m/p} + 1\}$$

The right-hand member of this equation is a geometrical series. Substituting the summation of this series in the above equation gives,

$$(18) \quad S_n^{(p)} = R \frac{1}{p} \frac{(1 + j/m)^{mn} - 1}{(1 + j/m)^{m/p} - 1}$$

To illustrate the use of this formula take the illustration in the preceding paragraph. Here  $R$  is \$100.00;  $p$ , 4;  $j$ , 6 per cent; and  $m$ , 2. Therefore,

$$S_n^{(p)} = \frac{100}{4} \frac{(1 + .03)^{10} - 1}{(1 + .03)^{\frac{1}{2}} - 1} = 577.43$$

The only term in this equation which is somewhat difficult to obtain is  $(1 + .03)^{\frac{1}{2}}$ . This cannot usually be found in ordinary interest tables such as are given in the back of this book but with the use of logarithmic tables the solution is greatly simplified.

#### PRESENT WORTH OF AN ANNUITY

What is the discounted present value of an annuity? This question is evidently the converse of that discussed in the preceding section. The answer to this question can also be developed in a similar manner for it is evident that the discounted value of all annuity payments must be the sum of the discounted values of each payment. Further, the present value of each



payment may be found from the formulæ in the second section in the chapter.

To make the problem concrete, what should be the purchase price of an annuity of \$100.00 per year payable at the end of each year for five years, if the investor desires to realize 6 per cent convertible annually on his investment? He is investing in five sums due at different times, and the following table shows the present value of the series as determined from formula (11).

$$\text{The first \$100.00 payment } P = 100 \frac{1}{1 + .06} = \$94.34$$

$$\text{The second \$100.00 payment } P = 100 \frac{1}{(1 + .06)^2} = 89.00$$

$$\text{The third \$100.00 payment } P = 100 \frac{1}{(1 + .06)^3} = 83.96$$

$$\text{The fourth \$100.00 payment } P = 100 \frac{1}{(1 + .06)^4} = 79.21$$

$$\text{The fifth \$100.00 payment } P = 100 \frac{1}{(1 + .06)^5} = 74.73$$

$$\text{The present value of the annuity } \$421.24$$

That is, if the investor turned over \$421.24 and received in return an annuity of \$100.00 per year for five years, he would realize 6 per cent interest on his investment.

A general formula for expressing the present value of an annuity can easily be developed. If  $A_n$  represents the present value of an annuity of  $R$  per year for  $n$  years, at the rate  $i$ , then

$$A_n = R \left\{ \frac{1}{(1+i)} + \frac{1}{(1+i)^2} + \frac{1}{(1+i)^3} + \dots + \frac{1}{(1+i)^n} \right\}$$

The term in the brackets is a geometrical series which can be summed to the expression:

$$\frac{1 - \frac{1}{(1+i)^n}}{i}$$

Placing this expression in the above equation, it becomes,

$$(19) \quad A_n = R \left\{ \frac{1 - \frac{1}{(1+i)^n}}{i} \right\}$$

Thus, the present value of the annuity in the illustration given above would be,

$$\begin{aligned} A_n &= 100 \left\{ \frac{1 - \frac{1}{(1+.06)^5}}{.06} \right\} \\ &= 421.24 \end{aligned}$$

In case the annuity payment is one dollar, equation (19) may be written,

$$(20) \quad a_n = \frac{1 - \frac{1}{(1+i)^n}}{i}$$

This is the expression for the present value of one dollar per year for  $n$  years at rate  $i$ . The numerator of the fraction is one minus the present value of one dollar due  $n$  years from date, while the denominator is the rate of interest. Computations from this formula would be quite simple in most cases, but Table IV in Appendix B gives the values of  $A_n$  for several different rates of interest. For example, the present value of one dollar per year for five years at 6 per cent (4.2123638) may be found in the column headed 6 per cent and opposite the fifth period. This quantity substituted in formula (19) for the preceding illustration gives,

$$\begin{aligned} A_n &= 100(4.2123638) \\ &= 421.24 \end{aligned}$$

Now as a second case suppose that the annuity payments of \$100.00 are in semiannual installments and that the interest rate is 6 per cent convertible semiannually. The present value of this annuity is the same as an annuity of \$50.00 per year for ten years at 3 per cent convertible annually. Expressed in general terms this question would be, what is the present value of an annuity of  $R$  per year payable  $m$  times per year for  $n$  years

at the nominal rate of  $j$  convertible  $m$  times per year? The equation for this is,

$$(21) \quad A_{mn} = \frac{R}{m} \left\{ \frac{1 - \frac{1}{(1 + j/m)^{mn}}}{j/m} \right\}$$

In the problem as stated the amounts would be,

$$\begin{aligned} A_{mn} &= \frac{100}{2} \left\{ \frac{1 - \frac{1}{(1 + .03)^{10}}}{.03} \right\} \\ &= 50(8.5302028) \\ &= 426.51 \end{aligned}$$

The value of the term in the brackets is found in Table IV in the 3 per cent column opposite the tenth period. Valuations of annuities of this class can be made in this manner with the aid of Table IV.

A somewhat different situation arises when the annuity payments are made annually but the interest is convertible  $m$  times per year. The formula for this case can be obtained by substituting for  $i$  in equation (19) its equivalent in terms of  $j$  and  $m$ , which gives,

$$(22) \quad A_n^{(m)} = R \left\{ \frac{1 - \frac{1}{(1 + j/m)^{mn}}}{(1 + j/m)^m - 1} \right\}$$

If the annuity payments of \$100.00 for five years are made at the end of each year, for example, and the interest rate is 6 per cent convertible semiannually, formula (22) can be used as follows,

$$A_n^{(m)} = 100 \left\{ \frac{1 - \frac{1}{(1 + .03)^{10}}}{(1 + .03)^2 - 1} \right\}$$

The second term in the numerator of the fraction in this formula can be found in Table II, in the 3 per cent column. The amount for the tenth period  $\left( \frac{1}{(1 + .03)^{10}} \right)$  is .7440939. The first term

in the denominator,  $(1 + .03)^2$ , can be found in Table I, in the 3 per cent column and for the second period, 1.0609. Substituting these quantities in the above equation the result is,

$$A_n^{(m)} = 100 \left\{ \frac{1 - .7440939}{1.0609 - 1} \right\} \\ = 420.21$$

This illustrates the common cases of this type. Tables have not

been prepared for the values of the expression  $\frac{1 - \frac{1}{(1 + j/m)^{mn}}}{(1 + j/m)^m - 1}$  therefore the fraction must be solved in the detail form as shown.

A third type of cases arises when the annuity payments are made  $p$  times per year but interest is converted  $m$  times per year. For example, what would be the purchase price of an annuity of \$100.00 per year, payable in four installments of \$25.00 for five years at 6 per cent convertible semiannually? This case can be presented in tabular form as shown on page 370.

Formula (13),  $P = S \frac{1}{(1 + j/m)^{mn}}$ , is used to obtain the present value of each payment. Thus for the first payment,  $m$  is 2 and  $n$ ,  $\frac{1}{4}$ , and the exponent of  $(1 + j/m)^{mn}$  is therefore  $\frac{1}{2}$ . For the second payment,  $m$  is 2 and  $n$ ,  $\frac{1}{2}$ , which makes the exponent 1, etc. Moreover as the present value of the annuity is the present value of all of the payments, the general formula would evidently be,

$$A_{mn}^{(p)} = R \left\{ \frac{1}{(1 + j/m)^{m/p}} + \frac{1}{(1 + j/m)^{m2/p}} + \frac{1}{(1 + j/m)^{m3/p}} \right. \\ \left. + \dots + \frac{1}{(1 + j/m)^{m(n-1/p)}} + \frac{1}{(1 + j/m)^{mn}} \right\}$$

The term in the brackets is a geometrical series which can be summed to the expression,

$$\frac{1}{p} \frac{1 - \frac{1}{(1 + j/m)^{mn}}}{(1 + j/m)^{m/p} - 1}$$

PERIOD	PAYMENT	EXPRESSION FOR PRESENT VALUE	PRESENT VALUE
1	\$25	$25 \frac{1}{(1 + .03)^{\frac{1}{2}}}$	\$24.63
2	25	$25 \frac{1}{(1 + .03)^1}$	24.27
3	25	$25 \frac{1}{(1 + .03)^{1\frac{1}{2}}}$	23.92
4	25	$25 \frac{1}{(1 + .03)^2}$	23.56
5	25	$25 \frac{1}{(1 + .03)^{2\frac{1}{2}}}$	23.22
6	25	$25 \frac{1}{(1 + .03)^3}$	22.88
7	25	$25 \frac{1}{(1 + .03)^{3\frac{1}{2}}}$	22.54
8	25	$25 \frac{1}{(1 + .03)^4}$	22.21
9	25	$25 \frac{1}{(1 + .03)^{4\frac{1}{2}}}$	21.89
10	25	$25 \frac{1}{(1 + .03)^5}$	21.56
11	25	$25 \frac{1}{(1 + .03)^{5\frac{1}{2}}}$	21.25
12	25	$25 \frac{1}{(1 + .03)^6}$	20.94
13	25	$25 \frac{1}{(1 + .03)^{6\frac{1}{2}}}$	20.63
14	25	$25 \frac{1}{(1 + .03)^7}$	20.33
15	25	$25 \frac{1}{(1 + .03)^{7\frac{1}{2}}}$	20.03
16	25	$25 \frac{1}{(1 + .03)^8}$	19.74
17	25	$25 \frac{1}{(1 + .03)^{8\frac{1}{2}}}$	19.44
18	25	$25 \frac{1}{(1 + .03)^9}$	19.16
19	25	$25 \frac{1}{(1 + .03)^{9\frac{1}{2}}}$	18.88
20	25	$25 \frac{1}{(1 + .03)^{10}}$	18.60
Total .....			\$429.68

Placing this expression in the equation the result is,

$$(23) \quad A_{mn}^{(p)} = \frac{R}{p} \left\{ \frac{1 - \frac{1}{(1 + j/m)^{mn}}}{(1 + j/m)^{m/p} - 1} \right\}$$

The only part of this equation which is difficult to solve is the term  $(1 + j/m)^{m/p}$  when  $p$  is greater than  $m$ . In such cases it is usually necessary to use logarithms to extract the root indicated by the fractional exponent. The expression in the numerator can be obtained from Table II. To illustrate the use of this formula, take the case just given. Here,

$$\begin{aligned} A_{mn}^{(p)} &= \frac{100}{4} \left\{ \frac{1 - \frac{1}{(1 + .03)^{10}}}{(1 + .03)^{\frac{1}{4}} - 1} \right\} \\ &= 429.68 \end{aligned}$$

There is still one further case in the valuation of annuities of sufficient importance to be mentioned in this section, namely a perpetuity. If an annuity of  $R$  per year is payable perpetually, the value can be obtained from formula (19). In this case,  $n$  is infinity and the equation becomes,

$$A_{\infty} = R \frac{1 - \frac{1}{(1 + i)^{\infty}}}{i}$$

The fraction  $\frac{1}{(1 + i)^{\infty}}$  is zero in any case, however, and the equation can therefore be written,

$$(24) \quad A_{\infty} = \frac{R}{i}$$

Thus a perpetuity of \$100.00 per year is worth at 6 per cent,  $\frac{100}{.06}$  or \$1,666.67. This method of valuing perpetuities is used very frequently, particularly in placing values on capital stock. A share of stock with a par value of \$100.00 on which a dividend of 10 per cent is consistently paid, for example, will sell at  $\frac{10}{.06}$  or \$166.67, if valued at the rate of 6 per cent.

## SINKING FUND CONTRIBUTIONS

The contract covering a bond issue frequently imposes upon the issuing corporation the responsibility of accumulating a fund for the purpose of retiring the bonds at maturity. Contributions are made to the fund in the form of annuity payments and usually these bear interest which is also added to the fund. In such cases it is desirable to make the annuity payment just large enough to permit the fund to accumulate with the interest additions to the desired sum and no more. That is, if the fund must accumulate to \$1,000.00 at the end of five years, the annuity payment will evidently be less than \$200.00, the actual amount depending on the rate of interest which can be earned by the fund. Stated in general terms, the problem is to determine the annuity payment which will accumulate to a definite sum in the future at a given rate of interest. Equation (14) expresses the sum to which an annuity of  $R$  per year will accumulate in  $n$  years at rate  $i$ . The present problem is merely the converse of this and may be solved by finding the value of  $R$  in that equation. Thus since,

$$S_n = R \left\{ \frac{(1+i)^n - 1}{i} \right\}$$

then,

$$(25) \quad R = S_n \left\{ \frac{i}{(1+i)^n - 1} \right\}$$

If the fund is to accumulate to \$1,000.00 in five years at 4 per cent convertible annually then,

$$\begin{aligned} R &= 1,000 \frac{.04}{(1.04)^5 - 1} \\ &= 1,000(.1846271) \\ &= 184.63 \end{aligned}$$

The sinking fund payments of \$184.63 will accumulate in five years to \$1,000.00, as shown by the following table :

(1) YEAR	(2) FUND AT BEGINNING OF YEAR	(3) INTEREST ON FUND DURING YEAR	(4) ANNUITY PAYMENT AT END OF YEAR	(5) FUND AT END OF YEAR
1	\$ 0.00	\$ 0.00	\$184.63	\$184.63
2	184.63	7.38	184.63	376.64
3	376.64	15.06	184.63	576.33
4	576.33	23.05	184.63	784.01
5	784.01	31.36	184.63	1,000.00

When the amount to be accumulated is 1, equation (25) may be written,

$$(26) \quad r = \frac{i}{(1+i)^n - 1}$$

This is the reciprocal of equation (15) and might be written,

$$r = \frac{1}{s_n}$$

The value of  $r$  in this equation can be obtained by taking the reciprocal of the quantity found in Table III at the given rate of interest and for the same number of years. A special table has been included in Appendix B for the value of  $r$  in equation (26). To find the annuity payments which will accumulate to one dollar in five years at 4 per cent, for example, refer in Table V to the 4 per cent column opposite the fifth period. The amount given here is .1846271, and if the amount to be accumulated is \$1,000.00 multiply by 1,000, and the result is \$184.63. This is the amount shown in the computation above.

If the sinking fund payment of  $R$  per year is paid into the fund  $m$  times per year, and interest is convertible  $m$  times per year, the amount of each contribution may be obtained by solving equation (16) for  $\frac{R}{m}$ , thus,

$$(27) \quad \frac{R}{m} = S_{mn} \left\{ \frac{j/m}{(1+j/m)^{mn} - 1} \right\}$$

For example, to find the semiannual payment to a sinking fund



which will accumulate to \$1,000.00 in five years at 4 per cent convertible semiannually, this formula may be used.

$$\frac{R}{m} = 1,000 \left\{ \frac{.02}{(1 + .02)^{10} - 1} \right\}$$

The term in the brackets may be found in the 2 per cent column, opposite the tenth period, in Table V.

$$\begin{aligned} \frac{R}{m} &= 1,000 (.0913265) \\ &= 91.33 \end{aligned}$$

That is, \$91.33 placed in a fund every six months, and accumulating at 4 per cent convertible semiannually, will amount to \$1,000.00 at the end of five years.

#### THE ANNUITY WHICH A PRINCIPAL WILL PURCHASE

This question frequently arises, particularly in the administration of estates. What sum will a certain principal purchase at a given rate of interest? In this case a certain sum is available for investment and it is desired to determine the annuity in which it may be invested. If the annuity to be purchased is a perpetuity, the question is easily answered. The annual payments will be the principal multiplied by the rate of interest involved. Thus the perpetuity which \$100,000.00 will purchase at 4 per cent is evidently \$4,000.00. But if the annuity is to run for a limited period, a more complex situation arises. If the \$100,000.00 is to be invested in a twenty-year annuity at 4 per cent, instead of a perpetuity, for example, what will be the annual payment? Stated in another way, \$100,000.00 is the present value of a twenty-year annuity of  $R$  dollars per year at 4 per cent, and it is desired to determine the amount of  $R$ . Now formula (19) expresses the present value of an annuity of  $R$  per year as,

$$A_n = R \left\{ \frac{1 - \frac{1}{(1 + i)^n}}{i} \right\}$$

In the present problem  $A_n$  is known but  $R$  is not, therefore solving for  $R$  the equation is,

$$(28) \quad R = A_n \left\{ \frac{i}{1 - \frac{1}{(1+i)^n}} \right\}$$

In the problem under consideration,  $A_n$  is \$100,000.00 and the value of  $R$  may be found from formula (28).

$$\begin{aligned} R &= 100,000 \left\{ \frac{.04}{1 - \frac{1}{(1+.04)^{20}}} \right\} \\ &= 100,000 (.0735817) \\ &= 7,358.17 \end{aligned}$$

That is, \$100,000.00 will purchase an annuity of \$7,358.17 per year for twenty years at 4 per cent.

It may be noticed that the expression  $\frac{i}{1 - \frac{1}{(1+i)^n}}$  is the reciprocal of the right-hand member of formula (26). The value of this expression may easily be obtained by taking the reciprocals of the amounts shown in Table IV for the same rates of interest and number of periods. The amount .0735817, for example, may be found by dividing 1 by the quantity found in Table IV in the 4 per cent column, opposite the twentieth period.

If it is desired to find the annuity payable  $m$  times per year for  $n$  years, which a given principal will purchase at the rate  $j$ , convertible  $m$  times per year, this may be done by solving the following expression for  $\frac{R}{m}$ .

$$(29) \quad \frac{R}{m} = A_{mn} \left\{ \frac{j/m}{1 - \frac{1}{(1+j/m)^{mn}}} \right\}$$

If the \$100,000.00 fund of the preceding illustration were to be invested in a twenty-year annuity, the payments of which were

made semiannually, and interest is involved at the rate of 4 per cent convertible semiannually, then,

$$\begin{aligned}\frac{R}{2} &= 100,000 \left\{ \frac{.02}{1 - \frac{1}{(1.02)^{40}}} \right\} \\ &= 100,000 (.0365557) \\ &= 3,655.57\end{aligned}$$

This is the semiannual annuity payment.

#### THE APPORTIONMENT OF ANNUITY PAYMENTS

When a principal sum has been invested in an annuity, the investor receives in return both his investment and interest in the annuity payments. In order to keep the investment intact, it is necessary to apportion the annuity payments between the return of the investment and the interest earning. To take a concrete case, suppose that corporation A offers a five-year annuity of \$20,000.00 per year, payable in semiannual installments, and that Mr. B purchases the annuity on a 5 per cent basis interest convertible semiannually. The purchase price (found by formula (21)) is \$87,520.64. Mr. B then invests an estate of \$87,520.64 in a security which will pay him \$100,000.00 during the succeeding five years. Now it is evident that the interest earned on the whole transaction is \$100,000.00 minus \$87,520.64 or \$12,479.36. But at what time is this interest earned? Surely a certain part of each annuity payment contains some interest. The question is, how much of each payment is interest, and how much a return of the original investment of \$87,520.64? This apportionment is shown in the table on page 377.

At the end of the first six months \$10,000.00 is received. Since an investment of \$87,520.64 was made at the beginning of this period, on a 5 per cent basis interest convertible semiannually, Mr. B has earned  $2\frac{1}{2}$  per cent on this amount at the time of the first payment. The amount of interest on this basis is \$2,188.02, and \$7,811.98, the balance of the annuity payment, is evidently a return of part of his original investment. The

amount remaining invested at the beginning of the second period is \$79,708.66, on which  $2\frac{1}{2}$  per cent, or \$1,992.72 is earned during this period. The balance of the payment, \$8,007.28, constitutes a further return of investment. The succeeding annuity payments are apportioned in like manner, and when the last payment is received, the total investment will have been returned together with interest on it to the amount of \$12,479.36. Further, the interest has been accounted for in the years during which it was earned. The maintenance of the integrity of the accounting period has been sufficiently emphasized in preceding chapters to show the necessity for such apportionment in any case.

(1) HALF-YEAR PERIOD	(2) INVESTMENT BEGINNING OF PERIOD	(3) ANNUITY PAYMENT	(4) INTEREST	(5) RETURN OF INVESTMENT
1	\$87,520.64	\$10,000.00	\$2,188.02	\$7,811.98
2	79,708.66	10,000.00	1,992.72	8,007.28
3	71,701.38	10,000.00	1,792.53	8,207.47
4	63,493.91	10,000.00	1,587.35	8,412.65
5	55,081.26	10,000.00	1,377.03	8,622.97
6	46,458.29	10,000.00	1,161.46	8,838.54
7	37,619.75	10,000.00	940.49	9,059.51
8	28,560.24	10,000.00	714.01	9,285.99
9	19,274.25	10,000.00	481.85	9,518.15
10	9,756.10	10,000.00	243.90	9,756.10
Total . . . . .		\$100,000.00	\$12,479.36	\$87,520.64

In general, then, annuity payments may be apportioned between investment and interest, (1) by multiplying the rate per period by the investment at the beginning of the period to find the amount of interest, and (2) by deducting the amount of interest thus found from the annuity payment to find the return of principal. In the illustration given, the dates for annuity payments and for converting interest correspond. In case the frequency of conversion differs from the number of annuity payments the interest earned each period can be determined from the proper formula in the preceding section, and the second step would be the same as stated above.

## THE VALUATION OF BONDS

The most common type of contractual security in American finance is the bond. A bond is a security which contains (from the point of view of accounting at least) two promises to pay, *viz.*, (1) a definite sum at a future date, called the *par*, and (2) an annuity from date of issue until the par is paid, called *bond interest*. The amount of the annuity payment is usually expressed as a percentage of the par. Thus a five-year, \$1,000.00, 4 per cent bond, interest payable semiannually, consists of (1) a promise to pay \$1,000.00 at the end of five years, and (2) an annuity of \$40.00 per year payable semiannually for five years. The 4 per cent stated in the bond serves no other accounting purpose than to express the amount of the annuity payment.

What, then, is the investment value of a bond? It is evident that this figure will be the sum of the present values of the two promises to pay. This sum can be conveniently expressed in a formula. If  $B$  represents the present value of a bond,  $S$ , the par value, and  $R$  the annual payment of bond interest, payable  $m$  times per year; and if the nominal rate of interest is  $j$ , convertible  $m$  times per year, the formula for determining the present value is,<sup>1</sup>

$$(30) \quad B = S \frac{1}{(1 + j/m)^{mn}} + \frac{R}{m} \frac{1 - \frac{1}{(1 + j/m)^{mn}}}{j/m}$$

Thus if the 4 per cent, \$1,000.00 bond mentioned in the preceding paragraph were valued on a 5 per cent basis, the equation just given would <sup>be</sup> ~~is~~ <sup>now</sup>,

$$\begin{aligned} B &= 1,000 \left\{ \frac{1}{(1 + .025)^{10}} \right\} + \frac{40}{2} \left\{ \frac{1 - \frac{1}{(1 + .025)^{10}}}{.025} \right\} \\ &= 956.24 \end{aligned}$$

<sup>1</sup> See formula (13) for the present value of a sum, and formula (21) for the present value of an annuity. There are bond tables prepared which give the values of  $B$  in this equation for different bond and market rates of interest.

The formula may readily be solved in most cases by using Table II for the

expression  $\left( \frac{1}{(1 + j/m)^{mn}} \right)$  and Table IV for  $\left\{ \frac{1 - \frac{1}{(1 + j/m)^{mn}}}{j/m} \right\}$ .

If the investor wished to realize 5 per cent convertible semi-annually on his investment, the purchase price of the bond would be \$956.24. This figure is called the purchase price or present value of the bond. The excess of par value over the present value is called the *bond discount*. The accumulation of bond discount between the date of issue and the date of maturity will be discussed in the next section.

It will be of interest to find the value of this 4 per cent bond on two other interest rate bases, 4 per cent and 3 per cent for example. If the market rate of interest is 4 per cent, then

$$B = 1,000 \left\{ \frac{1}{(1 + .02)^{10}} \right\} + 20 \left\{ \frac{1 - \frac{1}{(1 + .02)^{10}}}{.02} \right\}$$

$$= 1,000.00$$

In this case the present value of the bond is equal to the par and the bond is said to be sold *at par*. The bond interest just equals the market interest at each payment date. If, now, the market rate were 3 per cent, the present value would be,

$$B = 1,000 \left\{ \frac{1}{(1 + .015)^{10}} \right\} + 20 \left\{ \frac{1 - \frac{1}{(1 + .015)^{10}}}{.015} \right\}$$

$$= 1046.11$$

The present value here exceeds the par and the amount of the excess is called *premium*. The bond is said to be sold at a premium. The treatment of the premium between date of issue and maturity will be discussed in the next section.

Bond interest on the ordinary bond is payable twice a year, and interest on bond valuations is usually converted semi-annually. The above formula for bond valuation, therefore, covers most cases which arise in practice. Other conditions are possible, however, such as bond interest payable annually, while interest is convertible semiannually, or *vice versa*. Or the bond interest might be payable quarterly or oftener while the interest is convertible less frequently, etc. All such cases may be solved by using a combination of the proper equations for the present value of a sum and for the present value of an annuity as given

in the preceding sections. It is only necessary to consider the bond as made up of the two parts as suggested.

In the illustrations given above, it was shown that when the bond interest rate and the rate of interest used in the valuation are the same, the present value is equal to par; when the interest rate is greater than the bond rate, the present value is less than par; and when the interest rate is less than the bond rate, the present value is greater than par. Now it may easily be demonstrated that the difference between the par and present value is equal to the present value of an annuity, the annual payment of which is measured by the difference between the bond interest payment and the amount the bond interest payment would be at the market rate of interest. Thus if  $R$  represents the bond interest payment, payable  $m$  times per year, and  $I$  the amount the bond interest payment would be at the market rate, and  $D$ , the difference between the par value and present value of the bond, then,

$$(31) \quad D = \frac{R - I}{m} \left\{ \frac{1 - \frac{1}{(1 + j/m)^{mn}}}{j/m} \right\}$$

If  $R$  is less than  $I$ ,  $D$  is the discount; if  $R$  is greater than  $I$ ,  $D$  is the premium. For example, the discount on a 4 per cent, five-year, \$1,000.00 bond, interest payable semiannually, is, at 5 per cent,

$$\begin{aligned} D &= \frac{40 - 50}{2} \left\{ \frac{1 - \frac{1}{(1 + .025)^{10}}}{.025} \right\} \\ &= -43.76 \end{aligned}$$

The discount, \$43.76, deducted from the par leaves \$956.24, the present value of the bond. Now if the same bond is valued on a 3 per cent basis the premium is,

$$\begin{aligned} D &= \frac{40 - 30}{2} \left\{ \frac{1 - \frac{1}{(1 + .03)^{10}}}{.03} \right\} \\ &= 46.11 \end{aligned}$$

The premium, \$46.11, added to the par gives \$1,046.11, the present value of the bond.

ACCUMULATION AND AMORTIZATION

It is a fact scarcely needing demonstration that the difference between the amount received from the sale of bonds by a corporation and the total of the bond interest payments and par is *interest*. Yet a failure to recognize this fact has often led to erroneous entries on the books. Too often the bond interest payments alone are considered as actual interest, while discount is considered as a loss and premium as a profit. The impropriety of this reasoning seems fairly evident. If \$956.24, for example, is received for a \$1,000.00, five-year, 4 per cent bond, then the total interest is \$1,000.00 plus \$200.00 minus \$956.24, or \$243.76. The question immediately arises, however, as to the accounting periods during which the interest accrues, or what, in other words, should be considered as a net revenue charge in each accounting period during the life of the bond. The interest actually accruing in each period for the case just stated, assuming that the rate of interest involved in the valuation is 5 per cent, would be greater than the amount of bond interest paid during the same period. This fact is illustrated in the following table for the accumulation of discount.

(1) HALF-YEAR PERIOD	(2) INVESTMENT IN BOND BEGINNING OF PERIOD	(3) INTEREST ON INVESTMENT	(4) BOND INTEREST PAYMENT	(5) ACCUMULATION
1	\$956.24	\$23.91	\$20.00	\$3.91
2	960.15	24.00	20.00	4.00
3	964.15	24.10	20.00	4.10
4	968.25	24.21	20.00	4.21
5	972.46	24.31	20.00	4.31
6	976.77	24.42	20.00	4.42
7	981.19	24.53	20.00	4.53
8	985.72	24.64	20.00	4.64
9	990.36	24.76	20.00	4.76
10	995.12	24.88	20.00	4.88
Total . . . . .		\$243.76	\$200.00	\$43.76

In column (2) the figures given represent the present value or investment in the bond at the beginning of each half-year period.



At the beginning of the first period the value as already stated is \$956.24. The amount loaned to the corporation issuing the bond is \$956.24 and as the rate of interest involved is 5 per cent convertible semiannually, the amount of interest earned by the bondholder or the amount accruing against the net revenue of the corporation during the first period is  $2\frac{1}{2}$  per cent of the amount invested, or \$23.91. On this date the corporation pays this interest in part; \$20.00 is paid on account, so to speak, which leaves \$3.91 accrued but not paid. This latter amount (\$3.91) is added to the investment, as the bondholder's equity in the concern has — from an accounting standpoint — increased from \$956.24 to \$960.15. Now since the investment at the beginning of the second period is \$960.15, the interest which accrues in that period amounts to \$24.00. But again the corporation pays but \$20.00, which leaves \$4.00 to be added to the investment. At the end of each period a similar computation must be made in order that the correct amount of interest may be entered in the Net Revenue account. The accounting entries to be made at each date will be discussed in the next chapter.

The amount of the accumulation (column (5)) by the end of the fifth year is \$43.76. This is just the amount of the original discount, and on being added to the original investment brings that figure up to par. The total interest, \$243.76, is thus seen to be paid in two parts; \$200.00 in the form of an annuity and \$43.76 in the payment of par at the end of the fifth year; but the interest earnings are properly recorded in the periods during which they are earned.

If this bond were valued on a 3 per cent basis, the present value would be \$1,046.11 and the total interest, \$1,200.00 minus \$1,046.11 or \$153.89. The amount of interest for each period is shown in the table (page 383) for the amortization of premium.

The amount received for the bond at the outset is \$1,046.11; and since the interest rate is 3 per cent, convertible semiannually, the amount of interest accruing during the first half year is  $1\frac{1}{2}$  per cent of this amount, or \$15.69. A payment of \$20.00 is made at this time, however, which pays the interest accrual and \$4.31 of the investment besides, leaving the investment at the beginning of the second period at \$1,041.80. Then  $1\frac{1}{2}$  per cent on this amount gives \$15.63, the interest accrual for the second half

year. The \$20.00 payment at this time pays this interest and \$4.37 of the investment. This process, carried on to the end of the fifth year, reduces the investment to par at the time the bond is paid. The table given below shows the interest accruing in each period in column (3), the annuity payments (bond interest) in column (4), and the amount of the returned investment (amortization of premium) in column (5). The accounting entries concerning this case will be discussed in the next chapter.

(1) HALF-YEAR PERIOD	(2) INVESTMENT IN BOND BEGINNING OF PERIOD	(3) INTEREST ON INVESTMENT	(4) BOND INTEREST	(5) AMORTIZATION OF PREMIUM
1	\$1,046.11	\$15.69	\$20.00	\$4.31
2	1,041.80	15.63	20.00	4.37
3	1,037.43	15.56	20.00	4.44
4	1,032.99	15.49	20.00	4.51
5	1,028.48	15.43	20.00	4.57
6	1,023.91	15.36	20.00	4.64
7	1,019.27	15.29	20.00	4.71
8	1,014.56	15.22	20.00	4.78
9	1,009.78	15.15	20.00	4.85
10	1,004.93	15.07	20.00	4.93
Total . . . . .		\$153.80	\$200.00	\$46.11

#### DETERMINING THE INTEREST RATE

In all of the formulæ given so far in this chapter it has been assumed that the interest rate is a known factor. The interest rate is used in the right-hand member of the equations as a factor in the determination of the value of the unknown quantity on the left-hand side. It is possible to have situations arise, however, where the rate of interest involved is the only unknown quantity. This case frequently arises in connection with bond issues, and might arise in any of the other types of securities mentioned in this chapter.

Given the purchase price and bond rate of interest on a particular bond, what is the *market* rate of interest? A corporation, for example, will offer a certain bond for sale and the purchaser

makes his bid at a certain price. The corporation must determine the rate of interest involved in the transaction in order to make the proper entries on its books. In this case all of the quantities in formula (30) are known with the exception of  $j$ , and the problem is to determine the value of this term. Theoretically this can be done by solving the equation for  $j$  but when this is attempted the resulting equation has terms in the right-hand member that run into such high powers that it is practically impossible to solve in any given case. For this reason the ordinary algebraic method of solution is not resorted to. The only practicable method available is to estimate the rate. When one has become fairly familiar with bond valuations he can estimate the rates involved with some degree of accuracy. In order to finally determine the actual rate, however, several estimates are usually necessary; and trials are made until the correct rate is finally obtained.

The method of interpolation used in logarithmic tables is of considerable aid in this connection. To illustrate, if  $i$  represents the rate involved in the valuation, unknown, and  $A$  the present value of the bond, known; then (1) an estimate of the rate is made at  $i'$ , and the present value of the bond  $A'$  found at that rate; (2) a second estimate of the rate is made at rate  $i''$  and the value of the bond  $A''$  is found at this rate. If the two rates are fairly close to the actual rate, the following ratio is approximately true,

$$\frac{i - i''}{i'' - i'} = \frac{A - A'}{A'' - A'}$$

Therefore :

$$(32) \quad i = i' + \frac{A - A'}{A'' - A'}(i'' - i') \text{ (approximately)}$$

The value of  $i$  as found by this formula will usually be near enough to the actual rate for practical purposes, but if still greater accuracy is desired the rate thus found may be used for a new trial rate and the same operation repeated. By continuing to use the values for  $i$  in the equation for new trial rates several times, the rate involved will be obtained to a greater and greater degree of accuracy.

Suppose, for example, that a twenty-year, 4 per cent bond is sold for \$1,109.66. If the par value is \$1,000.00, at what rate

was the transaction consummated? The rate is probably somewhere between 3 per cent and  $3\frac{1}{2}$  per cent, and these rates may be used as first trial rates. The value at 3 per cent would be \$1,149.58, and at  $3\frac{1}{2}$  per cent, \$1,071.49. Using formula (32), then,

$$i = .03 + \frac{(1,109.66 - 1,149.58)}{(1,071.49 - 1,149.58)} (.035 - .03) = 3.255 \%$$

The rate thus found, 3.255 per cent, although not the actual rate, is probably near enough for practical purposes. In case greater accuracy is desired, 3.255 per cent may be used as a new trial rate with one of the other rates and the process repeated.

This same method of interpolation can also be employed in cases where the interest rate involved in an annuity is desired. Here the annuity tables are of particular service. The annuity payments and present value are both known but the interest rate is unknown. Divide the present value figure by the annuity payment figure and the dividend is the present value of one dollar per year at the unknown rate of interest. Look in Table IV for the two quantities which most nearly correspond to this figure for the same number of periods. Then interpolate between the interest rates for these two quantities and the result is the approximate interest rate.

Suppose, for example, that the X Company is a mining concern. It has \$100,000.00 of capital stock outstanding on which it is paying a 12 per cent dividend. It has just been determined that this dividend rate can be maintained for a period of ten years in the future, after which the mine is exhausted and the stock will be worthless. Suppose further that it is agreed that no fund shall be maintained to redeem the stock at the end of the ten years. The stock, from the point of view of the investors, is then a ten-year annuity of \$12,000.00 per year. Now an investor with all these facts at hand purchases \$10,000 par value of this stock for \$10,368.09. What rate of interest does he make on the investment? The \$10,368.09 is the present value of an annuity of \$1,200.00 per year for ten years. Dividing the first figure by the second gives \$8.6400761, and this is the present value of one dollar per year for ten years at the unknown rate. Referring now to Table IV, it may be seen that the nearest quan-

ties to this figure for ten periods are, 8.7520639 and 8.5302028 at the rates of  $2\frac{1}{2}$  per cent and 3 per cent respectively. Then,

$$\begin{array}{r} i - .025 = \frac{8.6400761 - 8.7520639}{.03 - .025} \\ i - .025 = \frac{8.5302028 - 8.7520639}{.005} \\ i - .025 = \frac{-.1119878}{.005} \\ \phantom{i - .025} = -.2218611 \end{array}$$

Solving this for  $i$  the result is,

$$i = .02752 \text{ or } 2.75 \text{ per cent approximately.}$$

The investor then will realize  $2\frac{3}{4}$  per cent on his investment. A similar situation arises whenever a return on a security depends on revenue from a wasting asset and no depreciation fund is maintained to reimburse the stockholders at the termination of the enterprise.

Most other cases in which the interest rate is the unknown factor are relatively simple and may be solved either directly from the formulæ given in the early part of the chapter or by interpolation with the aid of tables as just illustrated.

The formulæ presented in the foregoing discussion cover the more important problems in interest calculations. No attempt has been made to discuss the more intricate and complex problems that occasionally arise as those questions belong more particularly to the field of actuarial science than to accounting. Sufficient examples have been given, however, to illustrate the computations involved in the ordinary transactions met with in accounting practice.

## XVII

### INTEREST TRANSACTIONS — EQUITY ACCOUNTS

THE mathematical formulæ discussed in the last chapter are of a sufficiently general nature to be applied to accounting problems of very different types. They can be used in connection with contractual interest transactions affecting both sides of the balance sheet. This chapter will be devoted to a consideration of the transactions involving contractual interest particularly from the point of view of the equities. In such cases interest is an accrued deduction from net revenue in favor of the equities whose claims are listed among the fixed capital items on the equity side of the balance sheet. The ordinary situations which present themselves in the issuing of the typical forms of securities will be considered, and frequent reference will be made to the mathematical discussions of the preceding chapter.

#### LONG-TERM NON-INTEREST BEARING NOTES

Non-interest bearing notes are frequently used for borrowing in ordinary commercial transactions. Notes of this character are usually of the short-term type, that is for thirty, sixty, or ninety days. Their accounting treatment, already considered in an earlier chapter, is relatively simple. Long-term non-interest bearing notes, while very seldom used in practice, present certain questions of sufficient importance, however, to warrant special mention.

A corporation might find it convenient, for example, to raise capital by issuing a five-year, non-interest bearing \$10,000.00 note. The only advantage of such a procedure would lie in the fact that no cash payment would be required on the contract from the date of issue until the date of maturity. Interest would accumulate, however, in each accounting period, the amount depending

on the rate involved in the original sale. The investor would give \$7,440.94 for this note if the rate of interest involved were 6 per cent, convertible semiannually.<sup>1</sup> The entries on the corporation's books at the date of issue would therefore be,

Cash . . . . .	\$7,440.94
Discount . . . . .	2,559.06
Notes Payable . . . . .	\$10,000.00

These entries recognize the receipt of cash in exchange for a promise to pay a larger sum at a future date, the difference between the two amounts being placed in a valuation account. The investment at the outset is \$7,440.94, and as interest accrues at the rate of 6 per cent it amounts to \$223.23 during the first half year, and the entries at that time would be,

Interest . . . . .	\$223.23
Discount . . . . .	\$223.23

The charge to interest shows an accrual of \$223.23 in favor of the noteholder, and since no payment is made, the equity itself increases. This increase in equities is recognized by the credit to Discount, for a credit to Discount reduces this valuation account and this in effect increases the equity. Taken together the Notes Payable and Discount accounts *now show* the present investment<sup>2</sup> (\$7,664.17). The interest accrual during the second half year on this amount would be recorded as follows,

Interest . . . . .	\$229.92
Discount . . . . .	\$229.92

The entries for each succeeding period would be made in like manner until the end of the fifth year, at which time the entries recognizing the interest accrual would be,

Interest . . . . .	\$291.26
Discount . . . . .	\$291.26

The original charge to the Discount account would now be reduced to zero, and this means that the equity, notes payable,

<sup>1</sup> See formula (13), Chapter XVI, for the method of obtaining the present value of a sum due at a future date. Table II is of service in this case.

now stands at par. Since the note must be paid at this time the additional entries,

Notes Payable. . . . .	\$10,000.00	
Cash . . . . .		\$10,000.00

would now be made.

Thus the only transactions with the investor directly are the one at the beginning of the first year and the one at the end of the last year. The first transaction recognizes an investment and an equity claim of \$7,440.94, the last, the payment of an equity claim of \$10,000.00. The entries for the intervening period explain how the equity actually increased from the former to the latter figure. The following table shows in detail how the change occurs. Column (2) shows the investment at the beginning of each period; column (4) the investment at the end of each period; and column (3) the interest accrual which is also the increase in the investment. On the books, the investment is found in each case by deducting the balance in the Discount account from the credit of \$10,000.00 in Notes Payable.

(1) HALF-YEAR PERIOD	(2) PRESENT VALUE BE- GINNING OF PERIOD	(3) INTEREST	(4) ACCUMULATION
1	\$7,440.94	\$ 223.23	\$7,664.17
2	7,664.17	229.92	7,894.09
3	7,894.09	236.82	8,130.91
4	8,130.91	243.93	8,374.84
5	8,374.84	251.25	8,626.09
6	8,626.09	258.76	8,884.87
7	8,884.87	266.55	9,151.42
8	9,151.42	274.54	9,425.96
9	9,425.96	282.78	9,708.74
10	9,708.74	291.26	10,000.00
Total . . . . .		\$2,559.06	

The equity of the noteholder is thus shown to increase steadily from \$7,440.94 to \$10,000.00, and good financing would demand of the corporation that its assets available for liquidating this note should also increase by the same amount. That is, the



credits to Net Revenue from operation should always be sufficient to cover the interest debits. If this is not the case, the capital invested by the noteholder is impaired. It is true that he has no claim for these accruals until the note is due, but failure on the part of the corporation to earn the necessary amount does represent an impairment of capital. The total par of the note must be paid at maturity in any event, and if the interest accruals are not earned they must be met out of surplus — the stockholders' equity.

In case the date for closing the accounts and making statements should not coincide with one of the conversion dates for interest, accuracy of statement requires another adjustment in the accounts. Suppose, for example, that the five-year note just mentioned had been issued March 31st, making the dates of conversion March 31st and September 30th, and that the date for closing the accounts was December 31st. It would then be necessary to make an entry covering the interest accrual from September 30th to December 31st each year. The amount of this accrual theoretically should be found from formula (4). For the end of the first year it would be,

$$\begin{aligned} S &= 7,664.17 (1 + .03)^{\frac{1}{4}} \\ &= 7,664.17 (1.0148892) \\ &= 7,778.28 \end{aligned}$$

The amount of the interest would be \$7,778.28 minus \$7,664.17 or \$114.11; and the journal entries would be,

Interest . . . . .	\$114.11	
Discount . . . . .		\$114.11

This entry would cause Net Revenue to be charged with the interest actually accruing in the period ending December 31st, and would increase the equity item, notes payable, to its current status. Then at the next interest conversion date, March 31st, the entries should recognize the interest accruing for the remaining three months. This amount is found in the same manner as that for the preceding three months, and the entries are,

Interest . . . . .	\$115.81	
Discount . . . . .		\$115.81

The two entries, one for \$114.11, and one for \$115.81, make up the total interest accrual (\$229.92) for the conversion period of six months as shown by the table. Each year throughout the life of the note, the March 31st interest accrual would be apportioned between the two accounting periods on this basis.

In actual practice the bookkeeper would generally prefer to accrue interest on the simple interest basis for the three months rather than to use compound interest for a fraction of the conversion period as was done here. His reason for this is two-fold. First, it is much easier to compute the interest at the simple rate than at the compound rate. In the illustration given it would mean the simple division of the six months' interest by two. This result would be charged to Interest at each date, the same entries being made December 31st and March 31st,

Interest . . . . .	\$114.96	
Discount . . . . .		\$114.96

In the second place the difference between the two figures is so slight as to be of little importance to any of the equities involved. The difference here, for example, is that when the accurate method is used the December 31st entry is 85 cents less and that of March 31st is 85 cents more than when the entries are made equal by the bookkeeper's usual method. Yet although such a small error on a \$10,000.00 note is of little significance, in order to be theoretically correct the first method should be used.

#### ANNUITIES

Corporations in America have not as a general rule resorted to the practice of issuing formal annuities for the purpose of raising capital. The chief reason for this fact is that it has been convenient to finance through bond issues and the public is much more familiar with bonds as an investment security than with annuities. Annuities are, however, a convenient form of security for certain kinds of investment such as trust funds or estates, and there seems to be at present a tendency on the part of corporations to cater to this market. This tendency is evidenced by the extensive use of serial bonds. Such securities are practically but one step removed from annuities.

In addition to such definite annuities, however, there are a great many contracts which involve annuity computations. The purchase of leaseholds which bear an annual rental for a definite number of years, copyrights with a definite royalty payment, etc., are cases in point. The accounting treatment of such items often involves many questions of theory and a special chapter has been devoted to these topics. But the annuity aspects of these items are alike in character and can be explained by the use of an illustration of a definite annuity contract.

The A. B. Co., a corporation, promises to pay \$20,000.00 per year for five years, the amounts to be paid in semiannual installments, in exchange for some asset received. The asset received may be cash, a patent, a leasehold, or what not, as explained in the preceding paragraph. For purposes of illustration it may be assumed that the asset received is cash. The amount received would obviously be the present value of the annuity at the market rate of interest for the class of security involved. In case some other form of property were received, the value of the property item would also be the present value of the annuity at the market rate of interest. The property account, Cash in this illustration, would therefore be charged with the amount received as determined by the process of valuation shown in formula (21) of the preceding chapter. If the rate involved were 5 per cent convertible semiannually, this value would be \$87,520.64. The company receives, then, \$87,520.64 and promises to repay \$100,000.00 during the succeeding five years. The difference between the two quantities given is, of course, interest. The interest accrues during the intervening period and should be apportioned among the various net revenue statements prepared. The original entries at the date of issue would be,

Cash . . . . .	\$87,520.64	
Discount on Annuity . . . . .	12,479.36	
Annuity Payable . . . . .		\$100,000.00

Discount on Annuity is a valuation account, offsetting the liability account Annuity Payable which shows par rather than present value. At this date the annuity holder's equity in the assets is \$87,520.64, but the par value of all the annuity coupons

is \$100,000.00 — hence the necessity for a valuation account. The account Annuity Payable is used here to indicate the equity item. If the transaction is of a different type the name used for this credit would of course be different. Thus it might be Leasehold Payable, Royalties Payable, etc., depending on the nature of the contract. The annuity might even consist of a series of notes, non-interest bearing, all covered by the same security. In this case the Notes Payable account would be used.

At the end of six months, the first payment of \$10,000.00 is made and the entries would be,

Annuity Payable . . . . .	\$10,000.00	
Cash . . . . .		\$10,000.00

Interest has accrued up to this time amounting to  $2\frac{1}{2}$  per cent on the original value, or \$2,188.02; and this amount must be charged to Net Revenue for the period. The entries are,

Interest . . . . .	\$2,188.02	
Discount on Annuity . . . . .		\$2,188.02

This reduces the balance in the valuation account, Discount on Annuity, from \$12,479.36 to \$10,291.34, and the net equity is shown by the difference between this figure and the \$90,000 remaining in Annuity Payable, or \$79,708.66. The interest accrual for the next period is  $2\frac{1}{2}$  per cent of this amount or \$1,992.72, and the entries at the end of the period would be the same as for the preceding accrual except for the amount of interest involved. This procedure is followed at each payment date throughout the life of the annuity and at the end of the fifth year the balance of the Discount on Annuity account is reduced to zero. The amount of interest at each date may be found from the fourth column of the table on page 377 in the preceding chapter.

The Annuity Payable account will always have a credit balance equal to the par value of the unpaid annuity installments and the equity of the annuity holder is always the difference between this balance and the Discount on Annuity balance. In some cases it might be advisable to show the net equity in the Annuity Payable account and therefore not use the discount account at all. Following this procedure in the example given, the entries at the date of issue would be,

Cash . . . . .	\$87,520.64	
Annuity Payable . . . . .		\$87,520.64

The only objection to this procedure lies in the fact that at no place does the total liability on account of the annuity appear, and it is quite desirable to have this information presented in the balance sheet in some form.

The entries at the first payment date in this case would be,

Annuity Payable . . . . .	\$7,811.98	
Interest . . . . .	2,188.02	
Cash . . . . .		\$10,000.00

These entries reduce the balance of Annuity Payable to the present value of the remaining payments, and charge net revenue with the interest accrual. The same procedure would be followed for each subsequent payment date until the last. This would reduce the balance of Annuity Payable to zero.

When the dates for closing the accounts differ from the dates of the annuity payments, it becomes necessary to enter the interest accruing from the last payment date to the closing date. Suppose, for example, that the annuity mentioned above was issued October 1st and that the books are closed December 31st. The first payment will not be made until March 1st, but interest accrues at the rate of 5 per cent convertible semiannually for three months. The total accumulation by formula (4) would be,

$$\begin{aligned}
 S &= 87,520.64 (1 + .025)^{\frac{1}{2}} \\
 &= 87,520.64 (1.012423) \\
 &= 88,607.90
 \end{aligned}$$

The interest accrued would be \$88,607.90 minus \$87,520.64, or \$1,087.26, and the entries, if the first method of accounting for the annuity were used, would be,

Interest . . . . .	\$1,087.26	
Discount on Annuity . . . . .		\$1,087.26

The amount of the interest accruing for the following three months, up to the next payment date, may be found by the same method to be \$1,100.76, and this accrual calls for similar entries.

On this date, however, a payment of \$10,000.00 is made and the regular entry recording this payment must be made.

Here again it is customary to use the simple rate instead of the compound rate in accruing interest between payment dates. That is, instead of finding the compound interest for the three months ending December 31st, as was done in the illustrations, simple interest for the period at the rate of 5 per cent per year would be used. This computation would give \$1,094.01. The justification for this practice is its obvious simplicity as compared with the other method, together with the fact that the amount of the error is relatively small.

#### BONDS ISSUED AT PAR

Bonds are the most common form of security for raising capital exclusive of capital stock. The nature of the bond is quite familiar. It consists, as was shown in the preceding chapter (and earlier in the text), of two promises to pay: (1) a principal sum at a future date; and (2) an annuity in the form of bond interest payable from date of issue until the par is due. Failure to recognize this two-fold nature of the bond contract has often been the cause of rather serious accounting errors, especially in cases where bonds have been issued either at a discount or at a premium. It would be entirely possible to make the entries covering the two parts on separate bases by treating the par of the bond as a long-term non-interest bearing note, as was shown in the first section of the chapter, and the bond interest as an annuity, as was shown in the preceding section. Entirely accurate results would be obtained from this procedure. It is possible and much more convenient, however, to treat the bond as a unit in the accounts. Further, it is desirable to keep the information in regard to this equity in one account since the right to property and net revenue is vested in a single contractual claim. Current accounting practice, therefore, is to be preferred, if it does not lead to a misinterpretation of the facts.

The advantage of treating the bond as a whole is particularly evident when the bond is issued at par. In this case the present value of the par plus the present value of the bond interest payments is just equal to par, and each annuity payment just cancels

the accrued interest for the period. The bond is issued at par when the bond rate of interest and the market rate are the same. Thus, a 4 per cent, \$1,000.00, five-year bond, interest payable semiannually, would bring par if the market rate were 4 per cent convertible semiannually. The journal entries at the date of issue would be,

Cash . . . . .	\$1,000.00	
Bonds . . . . .		\$1,000.00

The \$1,000.00 entry in the Bonds account represents the present value of the bondholder's equity as represented in his claim for \$1,000.00 at the end of five years, and for ten payments of \$20.00 each every six months. The total claim is for \$1,200.00, but the present value, \$1,000.00, is entered in the account. This is the customary method of recording the original issue of bonds at par, and it will readily be seen that this is simpler than recording the sum of all payments in the Bonds account when it comes to recognizing the bond interest payments. At the end of six months the interest accrued on the amount invested at the market rate (4 per cent) is \$20.00. The bondholder is paid \$20.00 on his contract at this time, however, so that the bond interest payment just offsets the interest accrual. The only entries necessary, therefore, are,

Interest . . . . .	\$20.00	
Cash . . . . .		\$20.00

Since the accrual of interest will be equal to the bond interest payment at each payment date, these same entries will be sufficient at each date. The credit in the Bonds account then will remain steadily at \$1,000.00, this figure representing the present value of all future payments at each payment date as well as par. After the last bond interest payment, the Bonds account will still be stated at par, but the par of the bond is immediately paid and the entries,

Bonds . . . . .	\$1,000.00	
Cash . . . . .		\$1,000.00

close the transaction.

It was said that this method is simpler than it would be to credit the total of *all* payments to the Bonds account at the date

of issue. This is what would be done if the two parts of the bond were treated separately. It will be worth while, however, to consider the entries which would be made according to such a method. In the first place, the total of all the payments, \$1,200.00, would be credited to the Bonds account. But only \$1,000.00 is received in cash, the other \$200.00 is the interest, and not yet accrued; or, looked at in another light, this amount may be considered as the total discount on all payments. The entries at the date of issue would be,

Cash . . . . .	\$1,000.00	
Discount . . . . .	200.00	
Bonds . . . . .		\$1,200.00

The Discount account is again a valuation account offsetting the overstatement of the equity item, *Bonds*. The difference between these two accounts represents the present equity of the bondholder. At the end of six months interest would have accrued on this equity at the rate of 4 per cent amounting to \$20.00. This requires a charge to Interest and a credit to the valuation account, thus:

Interest . . . . .	\$20.00	
Discount . . . . .		\$20.00

But a cash payment is made to the bondholder amounting to \$20.00, hence the additional entries,

Bonds . . . . .	\$20.00	
Cash . . . . .		\$20.00

would be made. The Bonds account now shows a balance of \$1,180.00, this being the total of the remaining payments. At the same time the balance in the Discount account is \$180.00. Deducting this item from the balance in the Bonds account leaves \$1,000.00, the present value of the remaining payments. Interest on this figure for the next period of six months would again be \$20.00, and a payment of \$20.00 would be made at the end of the period necessitating the same entries as before. Again this would leave the net value of the equity at \$1,000.00. The same entries would then be made at the end of each period until the tenth. This process would reduce the Discount balance to zero, and at this time also the par of the bonds would be paid.



This latter method of handling the Bonds account, while seldom or never used in practice, illustrates quite clearly the nature of the bond contract, and calls particular attention to the fact that the par value figure is not of as great significance as the present value of the future payments. Still the simplicity of the first method of accounting is sufficient to commend it for general use where bonds are issued at par.

It was assumed in the above illustrations that the bonds were sold on the date of issue, that is, that the dating on the bonds was determined by the date the bonds were sold to investors. Very frequently in practice this is not the case. The total issue of a series of bonds bears the same date of issue, and the same interest payment dates, although the sales to investors are made at various dates. When the bonds are sold between regular interest payment dates, accrued interest to the date of sale must be taken into account.

Suppose, for example, that the series of bonds in which the one in the preceding illustration was included were issued as of March 31st, 1918. Then the interest payment dates would be September 30th and March 31st, and the par would be payable March 31st, 1923. Now the separate bonds might all be sold on March 31st, 1918, in which case the entries would be the same as those given above; or they might be sold in quantities at various dates after March 31st with accrued interest from that date. In the present illustration the bonds were issued at par, and if a \$1,000.00 bond of this series were sold on June 30th with accrued interest, the amount of cash received should be found by formula (4), which is,

$$S = P(1 + j/m)^{mn}$$

In this case  $P$  would be the present value at the preceding interest payment date (\$1,000.00);  $j$ , the market rate of interest (.04);  $m$ , the number of conversions (2); and  $n$ , the number of years ( $\frac{1}{4}$ ). Therefore,

$$\begin{aligned} S &= 1,000.00 (1 + .02)^{\frac{1}{2}} \\ &= 1,000.00 (1.009951) \\ &= 1,009.95 \end{aligned}$$

The accrued interest then at this time is \$9.95. The entries recording the sale of the bond would therefore be,

Cash . . . . .	\$1,009.95
Bonds . . . . .	\$1,000.00
Interest . . . . .	9.95

The accrued interest item is credited directly to the net revenue account, Interest, though no interest has been earned by the investor at this time. As a matter of fact the \$9.95 is a part of the bondholder's investment which is returned in the first bond interest payment. This fact can be clearly shown by taking the viewpoint of the investor for a moment. He has invested \$1,009.95 at 4 per cent convertible semiannually, and receives a payment at the end of three months. His investment has accumulated for three months at the stated rate, hence it will amount to,

$$S = 1,009.95 (1 + .02)^{\frac{1}{2}}$$

$$= 1,020.00$$

The original investment was \$1,009.95 and this accumulated to \$1,020.00; but \$20.00 is paid, and this reduces the investment to \$1,000.00. The interest earned by the investor for the period is \$10.05; and this is the interest chargeable to net revenue by the corporation. Now since \$9.95 was credited to Interest at the date of sale, the whole \$20.00 payment on September 30th can be charged to Interest in order to produce the desired net charge to this account. Then on September 30th the entries would be,

Interest . . . . .	\$20.00
Cash . . . . .	\$20.00

The net result of the entries in the Interest account may be seen in this account form.

# INTEREST

Sept.	30		\$20	00	June	30		\$9	95
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The \$20.00 charge on September 30th offsets the \$9.95 credit of June 30th, and leaves a net balance of \$10.05 on the debit side.

This is as it should be, a charge against Interest for the accrual from June 30th to September 30th.

It is customary in practice to apportion the interest accruing in a fractional part of an interest conversion period on a proportional basis rather than on the compound rate basis as shown here. That is, instead of charging \$1,009.95 for the bond in this case, the company would have charged \$1,010.00. The \$10.00 is simple interest for three months as compared with \$9.95 if the true compound rate were used. It is evident that this practice works to the disadvantage of the investor as he fails to realize the compound rate on his investment for the remaining part of the period in which he made the purchase. The difference is small, however, and therefore the investor seldom objects seriously to this practice, though as a matter of accuracy the compound rate should be used as was illustrated.

In case the accounts are closed at dates other than payment dates, interest again must be accrued for the fractional periods involved. To illustrate this point, suppose that the books of the corporation issuing the bond in the illustration above were to be closed on December 31st. Then interest must be accrued and entered on the accounts for the three months from September 30th. At the compound rate of 4 per cent convertible semi-annually this would amount to \$9.95 and the entries covering this accrual would be,

Interest . . . . .	\$9.95
Accrued Interest . . . . .	\$9.95

The Accrued Interest account would appear on the balance sheet as a liability. Then on March 31st, when the next payment is made, the entries would be,<sup>1</sup>

Interest . . . . .	\$10.05
Accrued Interest . . . . .	9.95
Cash . . . . .	\$20.00

The net result of these two entries is to place \$9.95 in the net revenue sheet of the accounting period ending December 31st

<sup>1</sup> Instead of using the Accrued Interest account the inventory method as shown in Chapter VIII might be used.

and \$10.05 in the succeeding period. This is just what is desired when accounts are kept on the accrual basis.

#### BONDS ISSUED AT A DISCOUNT

In the preceding section the simple case of bonds issued at par was treated; but bonds are very seldom issued exactly at par. The reason for this is the fact that corporations cannot, or at least do not, usually use the market rate of interest for the bond rate when issuing bonds. It is difficult to determine in advance just what will be the market rate for a given issue of bonds, and whenever the market rate is different from the bond rate the bonds will sell either at a discount or at a premium. Both of these cases present certain difficult accounting questions. In this section the problems of analysis arising in connection with bond discount will be considered.

If a five-year, 4 per cent, \$1,000.00 bond, interest payable semi-annually, were offered for investment on a market which called for 5 per cent convertible semiannually, the price would be \$956.24. (See formula (30), preceding chapter.) The amount of cash received at this time by the corporation is \$956.24 in exchange for its promise to pay \$1,200.00 (par \$1,000.00 and bond interest \$200.00). The difference between the amount received and the total promise to pay is interest, \$243.76; and the same must be distributed to the net revenue sheets of the proper years.

Here again it is current practice to credit the Bonds account with the par of the bonds issued. In this case, however, the par does not also represent the present value. This fact has led to a great deal of confusion in accounting practice. The par of the bond is a convenient figure to carry in the Bonds account. When the bonded indebtedness of a corporation is mentioned, for instance, the par value of the bonds is quoted, and the total capitalization is often referred to as the sum of the par values of capital stock and bonds. Further, in case of failure to meet interest payments it is generally recognized that the bondholder's claim on the mortgaged property is for the par value of his bond. All these facts tend to establish current practice as the most logical method. But — and here is where confusion usually arises — par and present value in this case are not synonymous.

Present value is somewhat less than par, and a valuation account must be kept to record this difference. This account is Discount on Bonds. The proper entries at the date of issue then are,

Cash . . . . .	\$956.24	
Discount on Bonds . . . . .	43.76	
Bonds . . . . .		\$1,000.00

It is the nature of the account Discount on Bonds that seems to cause most of the difficulty. This, as was just stated, is a valuation account whose function is to offset the amount entered in the Bonds account in order to reduce that item to the present status of the equity involved. Many peculiar notions arise in connection with this item among accountants and business men. Sometimes it is said that it is a property item. The argument for this contention runs something like this. Discount is a cost of getting capital; capital is just as essential to the establishment of an enterprise as the buildings, machinery and other structures; engineers' and draftsmen's salaries paid for the plans for the building are a part of the cost of the structure, and are charged to property accounts; therefore as discount is an item akin to the draftsman's salary, discount is a property item.

There are two very obvious answers to this contention. In the first place, the amount of discount entered in this account is only a part of the total discount on the issue. The total discount is the difference between the total promises and the present value, \$243.76, while the amount under consideration is only the difference between the par and present value, \$43.76. If this latter amount is property, then why not *all* of the discount? This would mean that all of the interest arising during the life of the bond would be charged to property, but no one would ever urge such a policy. Again, the amount of discount depends on the bond rate of interest. The higher the bond rate of interest, the less the discount. In fact if the bond rate is high enough there will be a premium instead of a discount, and who would think of *crediting* the property with the amount of the premium? Yet this is what such a policy would logically lead to and this should make it clear that discount is not a cost of property, but an interest item.

Another error consists in considering discount a loss. That

is, it is said that the corporation receives \$956.24 in return for a promise to pay \$1,000.00 and that therefore \$43.76 was lost in the deal. One can answer this again by saying that the amount of \$956.24 was received in exchange for a promise to pay \$1,200.00, therefore \$243.76 was lost in the transaction. When stated in this way, the absurdity of this claim is obvious.

The present value of the bond, then, is always shown by the difference between the par as shown in the Bonds account and discount as shown in the Discount on Bonds account. At the date of issue the balance sheet items representing the bond mentioned above would show,

Cash (or other property received for bonds) . . .	\$956.24	Bonds . . . . .	\$1,000.00
Discount on Bonds . . .	43.76		
	<u>\$1,000.00</u>		<u>\$1,000.00</u>

Now at the end of six months, a payment of \$20.00 is made for bond interest. There has accrued during the same period  $2\frac{1}{2}$  per cent of the original investment \$956.24, or \$23.91. There has accrued in favor of this equity, then, \$23.91, and but \$20.00 is paid in cash. The entries would be,

Interest . . . . .	\$23.91	
Cash . . . . .		\$20.00
Discount on Bonds . . . . .		3.91

The credit to Discount on Bonds reduces the balance in that valuation account and hence increases the net valuation of the bondholder's equity. Assuming that there was sufficient net revenue to cover the interest charge of \$23.91, the journal entry made at this time actually reserves \$3.91 in property for the bondholder. The situation as regards this bond, and exclusive of other facts, would be,

Property (from original issue) . . . . .	\$956.24	Bonds . . . . .	\$1,000.00
Cash (or other prop- erty retained) . . .	3.91		
	<u>\$960.15</u>		
Discount on Bonds . .	39.85		
	<u>\$1,000.00</u>		<u>\$1,000.00</u>

The present value of the bond as shown by this statement is \$960.15. The bondholder's equity has increased by \$3.91 as compared with the last statement. In fact it might be said that the bondholder has made a new loan to the corporation not in the form of cash but in the form of foregone interest. He accepts less in cash than the interest accrual on his investment. At the end of the next six months' period, the interest accrued on the investment since the beginning of the period at  $2\frac{1}{2}$  per cent would amount to \$24.00, and the entries would be,

Interest . . . . .	\$24.00	
Cash . . . . .		\$20.00
Discount on Bonds . . . . .		4.00

The results of these entries may easily be traced in the same manner as was explained above. The same procedure would be followed at each succeeding interest payment date. The amounts for each entry may be obtained from the accumulation of discount table shown on page 381. Accumulation tables are always of service in making entries for bonds issued below par.

In case the bond is issued between interest dates at a discount the method of entry is essentially the same as when issued at par, as was illustrated in the preceding section. Thus suppose that the 4 per cent bond which was sold on a 5 per cent basis had been dated March 31st as before, and that the sale was made on June 30th. In this case the selling price should be \$956.24, the price at the preceding interest payment date, plus interest at the rate of 5 per cent convertible semiannually for three months, that is,

$$\begin{aligned}
 S &= 956.24 (1 + .025)^{\frac{1}{2}} \\
 &= 956.24 (1.012423) \\
 &= 968.12
 \end{aligned}$$

and the accrued interest is \$968.12 minus \$956.24 or \$11.88. The entries would be,

Cash . . . . .	\$968.12	
Discount on Bonds . . . . .	43.76	
Bonds . . . . .		\$1,000.00
Interest . . . . .		11.88

The entries at the first interest payment date would then be the same as shown above, and the Interest charge of \$23.91 would offset the credit to interest of \$11.88, leaving the net charge to interest for the period at \$12.03. Again it should be mentioned that in practice such precision is seldom attained. The investor is generally charged simple interest from the last payment date. In this case simple interest would amount to 5 per cent of \$956.24 for three months or \$11.95. The bondholder is overcharged 8 cents on this plan and fails to earn the market rate during the succeeding three months, but the amount of the overcharge is small and may be considered as a sort of commission paid for the service of handling the funds.

In case the closing date falls between two interest payment dates, accrued interest must be taken into account. This is done in the same manner as shown in the preceding section. The accumulation should be figured at the market rate on the book value at the preceding interest date. Thus in order to close the books on December 31st for the bond just mentioned, interest must be accrued on the June 30th figures, \$960.15, at 5 per cent convertible semiannually for three months. This accrual amounts to \$11.93 and the entries are,

Interest . . . . .	\$11.93	
Accrued Interest . . . . .		\$11.93

Then on March 31st when the bond interest is paid the entries are,

Accrued Interest . . . . .	\$11.93	
Interest . . . . .	12.07	
Cash . . . . .		\$20.00
Discount on Bonds . . . . .		4.00

These latter entries cancel the Accrued Interest item on December 31st, charge Interest with the accrual since that date, and write off the proper amount of discount for the whole period.

#### BONDS ISSUED AT A PREMIUM

Whenever the market rate at which a bond is issued is less than the bond rate of interest, a bond sells at a premium. The present value of all the promises to pay involved in the bond con-



tract is greater than the par value. Here again it is customary to credit the Bonds account with just the par value, and this practice is justified by the same reasoning as in the case of bonds sold at a discount. This practice, however, has also led to incorrect analysis in many cases. The difficulty seems to lie in a failure to understand the nature of the additional amount received above par for the bond. For example, if the 4 per cent bond used in the preceding illustration were issued on a 3 per cent market basis, the amount of cash received would be \$1,046.11. The premium is \$46.11. Just what is the nature of this item? It is doubtless clear that it represents a part of the present value of the bond — a part of the investment of the bondholder — just as discount in the preceding case constituted a deduction from the par value to get the present value or investment of the bondholder. The amount of the premium, then, should be credited to an equity account, the proper journal entries being,

Cash . . . . .	\$1,046.11	
Bonds . . . . .		\$1,000.00
Premium on Bonds . . . . .		46.11

The total equity of the bondholder at this time is \$1,046.11. This is the present value of the total of all promises to pay, \$1,200.00. The difference between \$1,200.00 and \$1,046.11 is the total interest, or in other words it is the amount by which the total payments have been discounted.

Particular emphasis is placed on this fact because frequently one hears it said that the premium on bonds is a profit. In fact, cases are known where corporations have credited the premium on bonds to revenue or to surplus accounts. The absurdity of such a practice seems evident as this would mean that premiums received are revenue items, revenue obtained from one's own promise to pay. One might venture the remark that if revenue may be obtained as easily as this, why not go into the business of issuing bonds? Surely this would be much less troublesome than ordinary industrial operations. All that would be necessary to make large revenues would be high bond interest rates in comparison with the market rates, for the amount of premium depends on the bond rate of interest and this may be stated at any figure suitable to the management. Evidently, therefore,

premium on bonds is not a revenue but is part of the original investment.

Six months after the date of issue, interest accrues to the extent of  $1\frac{1}{2}$  per cent on the original investment. This accrual is \$15.69. The annuity payment on this date, however, is \$20.00, and the difference between these two amounts is a return of part of the original investment. The journal entries are,

Interest . . . . .	\$15.69	
Premium on Bonds . . . . .	4.31	
Cash . . . . .		\$20.00

The debit of \$4.31 to Premium on Bonds reduces the balance of that liability account. The present value of the bond at this date is the sum of the Bonds account balance, \$1,000.00, and the balance in Premium on Bonds, \$41.80, or \$1,041.80.

The function of the Premium on Bonds account can perhaps be shown more clearly by the use of a balance sheet statement. Taking into account just those facts relating to the issue of this bond, on the date of issue, the balance sheet would show,

Cash . . . . .	\$1,046.11	Bonds . . . . .	\$1,000.00
		Premium on Bonds . . . . .	46.11
	<u>\$1,046.11</u>		<u>\$1,046.11</u>

The bondholder's equity is shown in the two accounts on the liability side. Now at the end of six months, and after the first \$20.00 payment is made, the balance sheet would show, with respect to this bond,

Cash (or other Property)		Bonds . . . . .	\$1,000.00
from bond issue . . . . .	\$1,041.80	Premium on Bonds . . . . .	41.80
	<u>\$1,041.80</u>		<u>\$1,041.80</u>

If all of net revenue had been distributed, these statements would show the fact that an investment of \$1,046.11 was made, and that six months later \$4.31 was returned to the investor, leaving the net investment at \$1,041.80. Interest would accrue during the following half year at the rate of 3 per cent on \$1,041.80. This accrual is \$15.63 and the entries at this time would be,

Interest . . . . .	\$15.63	
Premium on Bonds . . . . .	4.37	
Cash . . . . .		\$20.00

This procedure carried out to the end of the fifth year would reduce the balance of the Premium on Bonds account to zero. At this time the only part of the bondholder's equity remaining on the books would be shown in the Bonds account (par). The bonds would now be retired at par and this equity would be entirely extinguished. The entries to be made during the life of such a bond can easily be obtained from an amortization table similar to the one explained on page 383.

In case a bond is sold at a premium on a date subsequent to the date of issue, accrued interest is charged to the investor from the last payment date, just as was shown in the preceding section where the bond was sold at a discount. As an illustration suppose that a 5 per cent bond due May 1st, 1921, interest payable May 1st and November 1st, is sold on a 4 per cent basis on August 1st, 1916. The value of the bond on May 1st at 4 per cent is \$1,044.91, and the August 1st price will be this amount plus interest at 4 per cent for three months. This amount may be obtained by formula, thus,

$$\begin{aligned}
 S &= 1,044.91 (1 + .02)^{\frac{1}{2}} \\
 &= 1,044.91 (1.009951) \\
 &= 1,055.31
 \end{aligned}$$

This price, \$1,055.31, is made up of: (1) par \$1,000.00; (2) premium May 1st, \$44.91; and (3) accrued interest from May 1st to August 1st, \$10.40. The entries at date of sale would include these three items.

Cash . . . . .	\$1,055.31	
Bonds . . . . .		\$1,000.00
Premium on Bonds . . . . .		44.91
Accrued Interest . . . . .		10.40

Three months later when the semiannual interest payment is made, the actual payment, though called semiannual interest, will really include: (1) the accrued interest item as shown in this entry; (2) the interest accruing since that date, \$10.50; and (3) \$4.10 on the premium. The entries will be,

Accrued Interest . . . . .	\$10.40	
Interest . . . . .	10.50	
Premium . . . . .	4.10	
Cash . . . . .		\$25.00

The Accrued Interest account here is treated in the same manner as was shown in the similar case for bonds sold at a discount. Another case in which the Accrued Interest account would be necessary is where the closing date is different from the interest payment date. The treatment of this case is analogous to that required for the cases already shown in the preceding section.

#### THE REFUNDING OF SECURITIES

In the illustrations of securities issued under various conditions thus far given, it has been assumed that the original contract is carried out to the date of maturity. That is, if a 4 per cent bond is issued on a 5 per cent basis, the entries were shown as they would normally be if no changes took place, as far as the issuing company is concerned, until the bonds matured. The market rate of interest used for determining the amount charged to net revenue remains at 5 per cent throughout the whole period. Some question might arise as to the propriety of retaining this original computation figure throughout the whole period. Most bonds are issued for relatively long periods of time, twenty, thirty, fifty and even ninety-nine years. Now it is true that the general market rate of interest changes during such periods, so that were the company to issue the same bonds at some later period, the interest rate would be different. Why then maintain the old 5 per cent market rate in the face of such changing market conditions? At first thought it might appear that this is in contradiction to the general viewpoint emphasized in this text that the accounts should always be sensitive to price change. Market conditions should be reflected in the accounts as soon as possible. Yet this contradiction is only apparent, for this situation is not analogous to the general situations emphasized in other connections. Here there is a definite contract entered into between the corporation and the bondholder. The whole agreement is consummated at the date of issue and the market at that date governs the whole contract regardless of how long

the time covered by the contract may be. There can be no change in the market rate of interest paid by the corporation so long as it is fulfilling the terms of the original contract. Any change in the general market situation affecting interest rates cannot affect the terms of this contract. Hence so long as the original contract remains in force, that is, so long as the bonds are outstanding, the original market rate of interest controls the journal entries as they have already been shown.

A company may have chosen to issue its bonds at an inopportune time, and thereby be compelled to pay a high rate of interest. If this is the case, that rate will apply to all of that corporation's transactions relating to these bonds until they are redeemed either at maturity or at an earlier date. This is undoubtedly the reason why corporations usually issue short-term bonds, five- and ten-year, during a period when the interest rate is high, and long-term bonds, twenty-, thirty- or fifty-year, when the interest rate is very low. It is an evidence of good financial management to choose a period of low interest rates in financing through bond issues.

In order that a concern might avail itself of an opportunity to get the benefit of an improvement in the interest rate in its favor, bonds are sometimes issued which are callable at certain dates by the corporation at par, or slightly above par. When this is the case the corporation has the right to cancel the old contract by paying the bondholder the par value; and then it may go on the market with an entirely new issue which will be sold at the new market rate. This process of refunding a debt for the purpose of getting a better rate seldom presents any very complicated accounting problems. The accounts representing the old contract at the date of refunding must be written off the books, and the new bonds entered in the new accounts.

Sometimes the option of cancelling the contract before maturity rests with the bondholder. He may, on certain specified dates, present his bond for redemption either at par or at some other stated price. He will exercise this privilege if the interest rate is increasing in order to make a more profitable investment, but if the interest rate is falling, he will prefer to keep the bond. In case he does exercise his privilege, the old accounts representing the bonds involved must be closed out.

Still another case of refunding consists in the issuing of a new security in exchange for an old one. A second mortgage, 5 per cent bond with five years yet to run, for example, might be cancelled in exchange for a  $4\frac{1}{2}$  per cent first mortgage thirty-year bond. If the exchange is made at par, then any discount or premium still on the books from the old issue must be spread over the succeeding thirty years instead of five. This case always involves the finding of the interest rate of the new issue of bonds as was shown in Chapter XVI. If the exchange is not made at par, the case is much more complicated but it would be treated the same in principle as though the old issue were cancelled through payment, and the new securities issued in exchange for the proceeds of the old. The balances in the discount or premium accounts would be increased or decreased according to the terms of exchange.

There are so many different situations that might arise in connection with the refunding of securities that no adequate classification can be made. The general statement can be made, however, that at the time of any refunding, accounts representing the old contract should be closed entirely and new accounts opened for the new contract in accord with the terms of the issue. The accounts for the old issue should have been kept up to the date of refunding according to the principles as shown in the preceding sections, and the new issue should be handled according to the same principles from that date forward. The main practical difficulty which usually arises is the finding of the new interest rate.

It has been the purpose of this chapter to explain the more important transactions involving interest calculations from the viewpoint of the equity accounts. It will be the purpose of the next chapter to consider the same question from the standpoint of the property accounts.

## XVIII

### INTEREST TRANSACTIONS — ASSET ACCOUNTS

THE last chapter was concerned with the interest transactions primarily as they affect the equity accounts. It is obvious that the same transactions which were discussed in this connection also involve the asset accounts on *some* ledgers. To make this clear one need only be reminded that there are two points of view to every list of asset items; one has to do with the equities in the property, the other with the property items themselves. Every equity item on one balance sheet may be represented on the asset side of the balance sheet of the party holding title to the equity. Capital stock, bonds, notes, etc., are all equities on the balance sheet of the corporation which has issued them, but the same items are assets on the books of the owners of the shares of stock, the bonds, the notes, etc. Further, certain firms and individuals act as trustees, executors, administrators, and in other fiduciary relationships to persons who own property of this character. In such cases, an analysis of the interest transactions involved is of particular importance. It is the purpose of this chapter to raise the problem of interest with particular reference to the asset accounts.

### INVESTMENTS IN SECURITIES

The first question to be considered in this connection is concerned with the investment by individuals and companies in the securities of other concerns. Whenever a firm or corporation invests in the notes, annuities, or bonds of another corporation, these securities must be entered in asset accounts and the earnings must be credited to the appropriate net revenue accounts for the periods during which the revenue is earned. At first thought one might suggest that the entries on the books of the owner of

the securities should be the reverse of those on the books of the issuing company. This, however, need not always be the case. The reason for this difference requires careful consideration. To make the question concrete, suppose that the X Company has purchased the amount of \$100,000.00 par value of the 4 per cent, twenty-year bonds of the Y Company, on a 5 per cent basis, interest convertible semiannually, the principal being \$87,448.62. Now as was shown in the last chapter the entries to be made on the books of the Y Company would be,

Cash . . . . .	\$87,448.62	
Discount on Bonds . . . . .	12,551.38	
Bonds . . . . .		\$100,000.00

At the date of the first interest payment the interest accrued would be  $2\frac{1}{2}$  per cent of \$87,448.62, and the entries,

Interest . . . . .	\$2,186.22	
Cash . . . . .		\$2,000.00
Discount on Bonds . . . . .		186.22

would be made. The valuation of the bonds remains on the books on a 5 per cent basis, and will remain so throughout the whole twenty years, or at least until the bonds are refunded. It was shown in some detail that this must be the basis of entry on the books of the issuing company, and that no change in the basis of valuation should be made as long as the original contract remains in force. The transaction takes place on a 5 per cent basis and no act of the corporation (except payment of the bond, refunding or failure) can alter this condition. The Y Company, therefore, accumulates discount according to the principles outlined.

Now the question at this point is whether the X Company should make entries exactly the reverse of those for the Y Company. That is, should the entries on the date of purchase and at the first interest payment date respectively be,

(1)

Bonds Owned . . . . .	\$100,000.00	
Cash . . . . .		\$87,448.62
Discount on Bonds Owned . . . . .		12,551.38



and,

(2)		
Cash . . . . .		\$2,000.00
Discount on Bonds Owned . . . . .		186.22
Interest . . . . .		\$2,186.22

According to this policy the bonds are carried on the books as an asset at all times at a net valuation determined by the present values of the future sums on a 5 per cent basis.<sup>1</sup>

It would seem offhand as if this were the proper procedure, since this is just the other side of the same contract which was recorded on the Y Company's books. If this were the method always to be adhered to, there would be no necessity for going further into an analysis of the entries on the books of the investor, since in every case of the purchase of a security the purchaser would make exactly the reverse entries of those made on the books of the issuing company; and these entries were explained in the last chapter. But there is some reason for inquiring as to a possible difference in the attitude of the investor toward the investment, as compared with that of the issuing company. The essential difference lies in the fact that the original owner of the bond need not remain an owner until the contract is cancelled. The corporation issuing the bond is *always* one party to the contract but the other party may change, in fact often does change because of the very ease of transferring securities from hand to hand. An investigation of the purposes for which securities are purchased will show that changes in the market rate of interest must in many cases at least be the basis for readjustments on the books of the purchaser when such readjustments would be entirely erroneous on the books of the issuing company.

What then are the purposes involved in the purchase of such securities? For convenience of discussion the following classification may be of service:<sup>2</sup> (1) investments where the con-

<sup>1</sup> It is probably unnecessary at this point to explain what is meant by the net valuation. The bonds are carried on the asset side at par in the Bonds account; Discount on Bonds Owned is a valuation account which shows the offset to par; and the net valuation of the securities involved is the algebraic sum of the balances from these two accounts.

<sup>2</sup> This classification is not intended to be exhaustive but rather to serve as a basis of investigation.

tractual character is dominant; (2) long-term investments which may be easily disposed of; (3) temporary and speculative investments.

In the first group would fall the annuities purchased from life insurance companies, the endowment funds of institutions and societies, and securities for which there is little or no market. In any of these cases the buyer has no intention of selling the security before maturity. The original owner, and investor, for practical purposes, may be looked upon as the other party to the contract permanently. In the case of an annuity purchased from a life insurance company, for example, there is very little opportunity to dispose of the security. Of course the owner might make an assignment of his right to receive the annuity installments but even this is an exceptional case and as such would not affect the generalization with respect to this class of assets. Certainly a change in the market rate of interest would have little or no effect on the value of such a security to the owner. The investor in securities of this class looks upon his investment as the other side of a contractual agreement, and he should make entries on his books which are the reverse of those on the books of the issuing company.

The statement that the entries in all cases in this class must always be the reverse of those on the books of the issuing company must not be taken as a rule to be rigidly adhered to. Conditions might arise which would cause a change in policy. The risks assumed by the investor might be considerably increased due to the fact of the issuing company becoming financially embarrassed. If such new conditions bring with them a loss to the investor such loss should be recognized in the accounts. But such situations are not typical of securities alone. Any asset item may suddenly become worthless because of some unforeseen contingency, and in such cases accounting practice demands that the book value of the asset be reduced. The exceptional loss of any asset must be recognized by a charge to net revenue or surplus at the time it is incurred. The rule given for the treatment of the securities in this class may therefore be accepted with this general reservation.

It is somewhat difficult to delimit this class of investments. The test which can be applied with best success is the question :

does the investor to all practical intents become a permanent owner of the security? If this question can be answered in the affirmative, the whole transaction may be treated as a contract governed by the general rule for this class, and there are certainly several situations in which the question asked may be answered affirmatively. The purchase of an annuity, already mentioned, is perhaps the clearest case. But, again, if an organization such as an educational institution is endowed, the fund being turned over in the form of bonds of a particular corporation, the case is practically a parallel with that of the annuity. The institution must, from the nature of the contract, keep the securities until maturity.

Another case, not quite so clear perhaps, is the investment in bonds or other securities of small corporations or municipalities for which there is practically no market. When an individual or firm invests in such securities his intention generally is to retain possession until maturity. He may sell before that date, but unless he does, he has no basis for making a revaluation as there is no general market for such securities which can be observed by the investor. He must therefore accept the interest rate involved in his own original purchase price as the basis for future valuations until such date as he actually disposes of his holdings. Such investments form no inconsiderable part of the total. To make this evident one need only recall from his own observation the fact that the securities actively dealt in and quoted on various stock exchanges constitute a very small percentage of the total securities in the hands of the public. Therefore it may be assumed that the number of cases is very large in which asset items represented by securities must be recorded by entries essentially the reverse of those on the books of the issuing company.

The second class consists of long time investments for specific purposes. The investments of insurance companies to meet their reserve requirements, of trust companies for savings funds and estates, the sinking funds of corporations, municipalities, and the like, come in this class. Should there be any difference in the treatment of these items as distinct from the first class? There is more reason for making adjustments in accordance with changes in the market situation here, for the investment is not

made with the intention of retaining the securities until maturity. The individual or corporation in this case makes the investment for the purpose of earning some interest on funds which are not needed for current operations but which must be available to meet its own future demands. An insurance company, for example, invests in bonds of another corporation in order to earn some interest on funds that are awaiting the demands of its policy holders. The important consideration for the insurance company is to have funds always available, either in cash or securities which can readily be turned into cash, to meet the maturity claims of its policy holders. Changes in the market prices of the securities held for investment purposes therefore are of particular importance and should be made a matter of record. The same thing may be said in general of the other investments in this group.

Investments made in securities that are likely to be resold should therefore be kept on the books at approximately the current price. This does not mean, however, that every fluctuation in price as reported on the stock exchange should be recorded on the books. The claims to be met by these securities are not demand claims in the sense that the funds must be available immediately on presentation of a claim. There is always the right reserved to defer the payment of a claim for some considerable time, sufficient at least to enable the company to dispose of its securities at an advantageous price. Small fluctuations in the quoted price, therefore, are of little significance. It is the relatively permanent or long time changes that must be booked.

As an example of the change in price referred to, suppose that the bonds purchased by the X Company in the illustration on page 413 were of this class. That is, the X Company made the investment with the intention of keeping a fund available to meet certain future claims upon itself. At the date of purchase it is supposed of course that the bonds would retain a 5 per cent valuation basis as this is the basis on which the bid is made. The original entries then are the same as shown above, namely,

Bonds . . . . .	\$100,000.00	
Cash . . . . .		\$87,448.62
Discount on Bonds Owned . . . . .		12,551.38

An accumulation table would be prepared on a 5 per cent basis for the purpose of making the entries which would be the reverse of those on the Y Company's books, and, assuming no essential changes in the market price of this bond the entries would be made on this basis. At the first interest payment date this entry would be made,

Cash . . . . .	\$2,000.00
Discount on Bonds Owned . . . . .	186.22
Interest . . . . .	\$2,186.22

And at each subsequent payment date the entries would be made on the same basis unless some change in the market price of importance took place.

Now suppose, however, that the market price of these bonds had changed to a  $5\frac{1}{2}$  per cent basis by the first interest payment date. The value of the bonds to the X Company would no longer be the same as the book value after the above entries were made. The value would be \$82,194.81. But the book value, after the interest payment is received and the journal entry recording the receipt has been made on the 5 per cent basis, as shown in the journal entry of the preceding paragraph, is \$87,634.84. The new book value should then be \$5,440.03 smaller than that shown in the accumulation table at 5 per cent. To make this correction the entries should be,

Net Revenue . . . . .	\$5,440.03
Discount on Bonds Owned . . . . .	\$5,440.03

The two journal entries taken together show a net loss for the period of \$3,253.81. The first entry credits Interest (net revenue) with \$2,186.22 and the second charges Net Revenue with \$5,440.03, which gives the net result as stated. The credit to Discount on Bonds Owned reduces the book valuation and leaves the net valuation at \$82,194.81. This is the present value of the bond (now having  $19\frac{1}{2}$  years to run) on a  $5\frac{1}{2}$  per cent basis. A new accumulation schedule should be made out and the entries made according to this schedule until a rather significant change occurs in the market rate.

In the case just given, the market rate increased, causing a loss to the investor. Many investment concerns which approve

of this policy in this case nevertheless object to writing up the asset if the market rate of interest decreases. Suppose, for example, that the market rate had fallen to  $4\frac{1}{2}$  per cent instead of rising. The present value would have been \$93,554.28 and a consistent policy would require the writing up of the book value as follows,

Cash . . . . .	\$2,000.00
Discount on Bonds Owned . . . . .	6,105.66
Interest (on 5% basis) . . . . .	\$2,186.22
Net Revenue (for appreciation) . . . . .	5,919.44

Subsequent entries should be based on an accumulation table at  $4\frac{1}{2}$  per cent until some further change in the interest rate.

The objector would say that the appreciation of the assets, \$5,919.44, is not realizable and therefore should not be considered as a revenue of the period. This is just the old question as to whether appreciation of assets in general should be recognized in the accounts; and as has been shown at numerous places, since it is the function of accounts to represent as far as possible present values, appreciation is logically as significant a fact as depreciation. The question as to whether cash has been received equal to the credit to Net Revenue is unimportant. An asset item of value equal to cash is present and available.

The general conclusion with respect to the second class of securities, therefore, is that changes in the rate of interest of a relatively permanent character should be recognized in the accounts.

The third class of investments in securities mentioned above consists in funds which are invested very temporarily and which must be available for other purposes practically on demand. The purchase of stocks and bonds by brokers, or more particularly the acceptance of such securities by banks as security for loans, are the typical examples of such investments. There is perhaps some question as to the advisability of considering these as investments, since they belong more in the category of speculative holdings.

In all cases of this class, the assets must be highly liquid in character. It must be possible to dispose of them readily to avoid financial embarrassment. In fact the securities are often

a form of merchandise for the firm holding them and ability to meet current liabilities depends in large measure on the opportunity to dispose readily of the stocks and bonds held. The market situation therefore is of the utmost importance and accumulation and amortization schedules are of little or no use. In most of these cases there is an active market, and valuations on the books should be adjusted to correspond with the quoted market prices very frequently. A broker, for example, should recognize market changes at least daily and in many cases it is better to follow the changes throughout the open market hours of the day. Banks holding large amounts of securities as collateral keep constantly in touch with the stock market, being prepared to sell the collateral to cover loans in case prices should materially lower.

It is evident that in this group, the mathematics of investment plays no part in the revaluation of securities owned. The continued contract relationship with the issuing company is not intended nor is the purchase made for relatively long-term investment purposes. The market is the continual basis of valuation.

The conclusions reached in this section may be briefly summarized as follows. There are roughly three classes of investments in securities. The first consists of long-term investments of which the investor intends to retain his possession until maturity. Here the contractual character of the transaction is recognized and subsequent valuations should be made on the basis of the original market rate of interest. The second consists of long-term investments made primarily for investment purposes where there is no intention of recognizing the continued contractual relationship. Here small changes in market conditions should not be recognized but relatively permanent changes should be the basis for revised book figures. The third class consists of speculative investments. Here the market situation is the sole guide to the revision of book valuations. It is impossible to give a hard and fast rule as to just when a security is in one or the other of these classes but the facts of each situation should be taken into consideration in making the assignment.

## INTEREST IN FIDUCIARY ACCOUNTING

Many of the questions already raised in connection with principal and interest present themselves in a peculiar manner to the person or corporation acting in a fiduciary capacity. The most common example is the trusteeship for an estate. The trustee is intrusted with the administration of the estate of the deceased in accordance with the terms of the will. In general this task does not present any particular problems as distinct from any other form of accounting. The estate must be administered in a businesslike manner in the interests of the beneficiaries. The property belonging to the beneficiaries is managed by the trustee. All net revenue as well as the corpus of the estate is distributed according to the terms of the probated will.

It would seem proper then to compare the position of the trustee with that of the manager of a private business. He manages the property or business of others and renders periodic accounting statements to those who have equities. The essential difference lies in the apportionment of the net revenue and assets to the proper parties. Instead of a board of directors meeting to decide on these questions, the will of the deceased, as approved by the proper court, is the guide. The actual records kept and the method of recording transactions are highly specialized, but the accounting principles are essentially the same as for any business.

The importance of maintaining the integrity of the accounting period in this case should be especially emphasized. The will, for example, often specifies that the income of the estate shall be paid to one person (the life tenant) throughout his or her life and that the corpus of the estate shall pass to another person (the remainder man). Now it is evident that any misstatement of net revenue is bound to jeopardize the interests of either one or the other of these parties. To make the case concrete suppose that A dies and leaves an estate which, after all the expenses incident to probating the will, taxes, etc., have been met, amounts to \$106,838.87.<sup>1</sup> The will provides that all

<sup>1</sup> The amount was assumed at this figure to make the illustration particularly effective. In no case would the whole estate happen to equal the present value of some particular bond at the market rate. This illustration may be considered to refer to the part of such an estate invested in a particular security.



the income of the estate should go to the widow B, and that at the death of B the corpus of the estate should pass to the son C. The trustee must manage the investment of the estate, pay expenses of management, obtain his own fee from the gross revenue, and pay all net revenue to B throughout her life. Suppose further that the trustee decided to purchase \$100,000.00 par value X Company, twenty-year,  $4\frac{1}{2}$  per cent bonds which are quoted at \$106,838.87, this being on a 4 per cent basis. The balance sheet of the estate at this time would be,

Bonds — X Company	C's Equity . . .	\$106,838.87
Par . . .	\$100,000.00	
Premium . .	6,838.87	
	<u>\$106,838.87</u>	<u>\$106,838.87</u>

Now at the end of six months, the trustee receives \$2,250.00 from the X Company for bond interest. How should this amount be treated as between B and C? It is clear that, unless the market rate of interest has fallen, the value of the bonds has decreased. The actual interest earned is \$2,136.78, and therefore the remaining \$113.22 is a return of principal, a part of C's equity. Only \$2,136.78 (ignoring the trustee's commissions and expenses) should be turned over to B, and the balance sheet would then show,

Bonds — X Company	C's Equity . . . .	\$106,838.87
Par . . .	\$100,000.00	
Premium . .	6,725.65	
	<u>\$106,725.65</u>	
Cash . . . . .	113.22	
	<u>\$106,838.87</u>	<u>\$106,838.87</u>

The cash item, \$113.22, should now be invested as a part of the principal and the interest turned over to B. At the next interest payment date only 2 per cent of \$106,725.65 should be considered as income (as far as that portion of the estate invested in the X Company's bonds is concerned). In other words the amortization schedule must be used to apportion the bond interest payments between the two beneficiaries. It should be the purpose of the

trustee to keep C's equity at \$106,838.87 continuously, and this could be accomplished only by writing off the bond premium, as shown above. Failure to recognize the necessity of this procedure would lead to the dissipation of a part of the estate. That this would be the case may be shown very clearly by assuming that B lives for twenty years after the death of A and that the bonds of the X Company are held until maturity. At the end of the twentieth year, the bonds are paid off at par and the balance sheet would then show only,

Cash . . . . .	\$100,000.00	C's Equity . . .	\$100,000.00
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The amount of \$6,838.87 would have been paid to B in the bond interest payments at the expense of C's equity. If the total of the bond interest payments were treated as income, then, the terms of the will would be violated.

On the other hand, the trustee might have purchased bonds at a discount. Here the accumulation of discount table should be used. In order to simplify the illustration in this case, it will be assumed that the estate amounted to but \$93,724.30, the conditions of the will being as before, and that the trustee purchased \$100,000.00 of the 4½ per cent, twenty-year bonds of the Y Company at \$93,724.30 — this being on a 5 per cent basis. The balance sheet now appears as follows,

Bonds — Y Company	C's Equity . . .	\$93,724.30
Par . . . . . \$100,000.00		
Less Discount . . . 6,275.70		
<u>\$93,724.30</u>		<u>\$93,724.30</u>

Now at the end of six months \$2,250.00 is received from the Y Company as bond interest but the actual interest accrual is \$2,342.11; and this amount should be accounted for as B's equity. If only the \$2,250.00 were turned over to B the balance sheet should show,

Bonds — Y Company	C's Equity . . .	\$93,724.30
Par . . . . . \$100,000.00	B's Equity . . .	93.11
Less Discount . . . 6,182.59		
<u>\$93,817.41</u>		<u>\$93,817.41</u>

The value of the investment in the Y Company's bonds has increased by \$93.11, and since income goes to B by the terms of the will, this must be considered as B's equity.

A question might arise as to how this income can be paid to B inasmuch as there is no cash in the trustee's hands to cover this item. This is a very practical question. B might, of course, leave the income with the trustee on deposit so to speak until the bonds mature. The obvious objection to this is that B might die long before this time and would have been deprived of this income in the meantime. C might purchase the right to this item from B and thus have it credited to his account; or in some cases the trustee might be called upon to make the advance to B, accepting a lien on the bonds at maturity as consideration.

The actual decision with respect to the treatment of B in this situation is not an accounting matter. Whatever arrangement is adopted may easily be recorded in the books, but the important accounting consideration is the recognition of the accumulation of discount as an income which accrues in favor of the life tenant.

Another situation might arise with respect to the bonds either in the case of purchase at a premium or at a discount. The market value of the security might change. It might show a tendency to increase permanently or decrease permanently in value. Should this fact be considered by the trustee? This situation would come under the second class of cases in the preceding section. Permanent changes should be recognized. Failure to take the new market conditions into account would work to the disadvantage of the remainder man in case of falling prices and to the disadvantage of the life tenant in case of rising prices.

In the discussion thus far in this section it has been assumed that the trustee simply acts as agent for the estate, that title to the property remains in the estate, and that the trustee receives a stipulated fee for his service. In many cases, however, the trustee takes over title to the property of the estate and agrees to pay a definite return to the life tenant and to turn over funds equal to the value of the corpus of the estate to the remainder man at the death of the life tenant. In such cases the trustee's balance sheet shows on the asset side the property to which he

has title and on the liability side the equity of the remainder man in the trustee's assets. Any excess of assets over the remainder man's equity (and other liabilities) is the trustee's own equity. The net revenue sheet shows a distribution of income to the life tenant on a contractual basis and any residue after this distribution is a credit to the trustee's accounts. No particular accounting problems as distinct from those in the preceding section arise here. The business of a trustee may in this case be likened to a pure investment business, and the estate treated as a long time deposit the interest on which is paid to a different party than the investor.

Other cases of fiduciary accounting, while often involving many complicated questions, do not as a rule present different situations with respect to interest computations and analysis than those given. A special discussion of accounts for receivers, in cases of bankruptcy, realization and liquidation, etc., is given in a later chapter of the text.

#### SINKING FUNDS

It is customary for corporations to protect the interests of their bondholders by making some provision in the bond contract with regard to assets to be used for meeting the bonds at maturity. Often this provision takes the form of a sinking fund requirement. This calls for the setting aside of a special fund to accumulate by the annual contributions of the corporation, and interest earned on the fund, to the par of the bonds at maturity. The funds thus set aside may be placed in the hands of a trustee outside of the organization, or may be retained as a separate fund in the possession of the corporation but not used for current operations. The accounting entries for sinking funds are of particular interest as considerable confusion exists on this point.

The amount of the sinking fund contribution may be determined by formula (25). The rate of interest involved may be obtained in different ways. If the corporation intends to handle the fund itself, the rate of interest will depend on what can be obtained from time deposits at a bank or trust company, or on the rate it can expect to obtain from investment in other securities. If the fund is to be handled entirely by a trust company, the rate may be determined by agreement. The trust company

agrees to pay a certain rate, say 4 per cent, on all contributions. Once the rate has been decided upon the annual contribution necessary may easily be determined.

For an illustration of the entries suppose that the X Company has issued \$1,000,000.00 of 4 per cent, twenty-year bonds, with a sinking fund proviso in the bond contract. The trust company which agrees to handle the fund will pay 4 per cent per annum on the contributions. The annual payment necessary then is \$33,581.75. At the end of the first year this amount is paid over to the trustee, the entries being,

Sinking Fund Assets . . . . .	\$33,581.75	
Cash . . . . .		\$33,581.75

Of course the debit might be made to the sinking fund trustee account, but for balance sheet purposes the title Sinking Fund Assets is more desirable. At the end of each successive year, the same amount would be paid to the trust company and the same entry made until the end of the twentieth year, when the fund would have accumulated in the trustee's hands to \$1,000,000.00.

The interest as it accrues in the hands of the trustee must also be recognized on the corporation's books. At the end of the second year the interest amounts to \$1,343.27. This is retained by the trustee but it is property of the corporation and should be treated as such. The entries would be,

Sinking Fund Assets . . . . .	\$1,343.27	
Interest . . . . .		\$1,343.27

The third year's interest earning on the fund would be 4 per cent of the total fund at the beginning of the third year. This would be \$2,740.27, and the entry would be the same in form as the previous one.

It is important to notice the effect of this sinking fund policy on the balance sheet of the corporation. Suppose, for example, that the X Company originally issued \$1,000,000.00 of stock at par together with the same amount of bonds at par and used the proceeds for purchasing the necessary fixed and current assets for carrying on its operations. The balance sheet in summarized form would show,

Property (used in operation) . . .	\$2,000,000.00	Capital Stock . . .	\$1,000,000.00
	<u>\$2,000,000.00</u>	Bonds . . . . .	<u>1,000,000.00</u>
			<u>\$2,000,000.00</u>

Now at the end of the first year let it be assumed that all proprietary net revenue is distributed to the stockholders in dividends so that there will be no accumulated surplus. Then as a result of the sinking fund transactions described above, \$33,581.75 of the original property used for business operations must have been converted into cash and the cash turned over to the sinking fund trustee. The balance sheet would then show,

Property (used in operation) . . .	\$1,966,418.25	Capital Stock . . .	\$1,000,000.00
Sinking Fund Assets	<u>33,581.75</u>	Bonds . . . . .	<u>1,000,000.00</u>
	<u>\$2,000,000.00</u>		<u>\$2,000,000.00</u>

Passing now to the end of the second year and making the same assumption the balance sheet would show that additional assets were turned over to the sinking fund trustee equal to the second payment and interest on the first. Interest on the first payment, it must be remembered, was credited to net revenue and according to the assumptions made proprietary net revenue is paid in dividends.

Property (used in operation) . . .	\$1,931,493.23	Capital Stock . . .	\$1,000,000.00
Sinking Fund Assets	<u>68,506.77</u>	Bonds . . . . .	<u>1,000,000.00</u>
	<u>\$2,000,000.00</u>		<u>\$2,000,000.00</u>

If this policy were continued until the end of the twentieth year the assets would consist of \$1,000,000.00 used in business operations and \$1,000,000.00 in the sinking fund trustee's hands. The latter sum of course would then be used for paying off the bonds and there would be left but \$1,000,000.00 of property represented by the stockholders' equity.

It must be admitted that this is an extreme case but it was stated in this form to illustrate the effect of the sinking fund policy on the business when no restrictions are placed on the payment of dividends. The effect is evident; the bondholders'

investment is gradually transformed from property used in the particular business for the purpose of producing revenue, to a fund in the hands of a trustee. The margin of safety for the bondholder is not altered from the original condition.

This is an unusual case as the average corporation would not pay all of its net revenue in dividends but would accumulate a surplus of some size. The growth of that surplus is of particular importance to the bondholders as the margin of safety for the bond increases in direct proportion to the increase in that figure. The bondholders may and often do wish to have that surplus increase by exactly the same amount as the sinking fund increases each year. When this requirement is placed in the bond contract it is said that the corporation must accumulate its sinking fund "out of profits." It is the use of this phrase that causes so much confusion in accounting for sinking funds. This phrase simply calls upon the directors to set aside sufficient net revenue to equal the sinking fund requirements before paying dividends, and further to label that part of the surplus so reserved as Sinking Fund Reserve. This part of the requirement is entirely distinct from the other and necessitates another pair of journal entries each year. The entries the first year would be,

Net Revenue . . . . .	\$33,581.75
Sinking Fund Reserve . . . . .	\$33,581.75

This would set up a specialized surplus account on the liability side of the balance sheet. The next year the same entries would be made except that this time the amount should be increased by the amount of the interest accrual. When this requirement is included in the contract, the property used in business operation can be maintained at \$2,000,000.00 as the amount turned over to the trustee comes from net revenue obtained from the sale of the product.

At the end of the twentieth year the sinking fund assets would be used to pay off the bonds and the balance sheet would then appear,

Property (used in operation) . . .	\$2,000,000.00	Capital Stock . .	\$1,000,000.00
	\$2,000,000.00	Sinking Fund Reserve	1,000,000.00
			<u>\$2,000,000.00</u>

The Sinking Fund Reserve then becomes a free surplus as was explained in a previous chapter. (See Chapter XIII.)

It has been the purpose of the past four chapters to explain the nature of the interest problem as it affects accounting in general, to explain certain mathematical formulæ for the computation of interest, to illustrate some of the situations that arise which require interest calculations and entries in connection with equity accounts, and to analyze similar transactions with respect to asset accounts. The preceding chapter was concerned with problems connected with the equity accounts and therefore with the subject matter of Part Two. This chapter is concerned primarily with the valuation of certain kinds of assets involving interest calculations and is therefore closely connected with the subject matter of Part Four.





**PART FOUR**  
**THE VALUATION OF ASSETS**



## XIX

### ORGANIZATION AND CONSTRUCTION

UNDER the general head of the valuation of assets it will be convenient to consider first the problem of determining the original property values arising during the organization and construction period. The setting up of the asset accounts and the preparation of the first balance sheet are matters which often involve troublesome questions. This is particularly true of the initiation of the large enterprise. In fact the extent of the financial program required to successfully launch the typical modern enterprise, and the complex nature of the property equipment necessary to the operation of such an undertaking, give rise to some of the most difficult problems of accounting analysis. The organization of a single-proprietor enterprise or partnership, with a capital outlay of a few thousand dollars, can be speedily accomplished, and the purchase or actual construction of the necessary property will usually require but a few weeks — or possibly months. The modern corporation, however, often requires many millions in capital, and the construction of the property — in the case of a railroad enterprise, for example — sometimes covers a period of several years. In the following discussion it will not be attempted to cover completely all the accounting problems that arise in this connection. But sufficient illustrations will be presented to suggest the nature and scope of the questions involved, and as far as possible the principles according to which these questions must be answered will be stated.

#### ORGANIZATION COSTS

It is sometimes urged that certain organization costs which do not directly result in physical property should be considered as expense rather than as investment. Examples of such items are

lawyers' fees and other clerical incorporation costs, commissions paid to underwriters, fees paid to promoters, etc. There is no force in this contention. All legitimate costs which must be incurred to bring about the successful organization of the enterprise can properly be considered as *cost of property* or investment.

In the first place it should be observed again that whether an item results in an addition to *physical* property or not is a point of little significance for accounting. Even the outlays for actual construction represent payments for elements other than physical commodities. Both labor and material costs are involved in nearly all items of physical property; and material cost itself, moreover, can be resolved again into labor and material cost. Both commodities and services are purchased concurrently during the entire construction period; and one cost is just as thoroughly a part of the investment as the other. The property category, as has been emphasized repeatedly in the preceding pages, is fundamentally an economic rather than a physical concept.

Further, the engineering costs — both commodities and services — are no more properly capital outlays than are the costs of financiering. The building of a railroad, for example, could never be accomplished by the construction engineer alone. The capital of the investor must be drawn to the task, and it may be necessary to interest hundreds or even thousands of individual capitalists. Hence the cost of the promoters' services (the promoter may be said to be the *financial* engineer), the cost of the prospectus, the expenses of underwriting, issuing security certificates, etc., fees paid to the government for the privilege of incorporation — all these outlays are property charges.

It might be urged that some services, like those furnished by the underwriter, do not have definite market prices, and hence that expenditures for such services are susceptible of financial juggling and manipulation. It is true that the commissions paid to organizers are frequently illegitimate in the sense that nothing of value is received, and occasionally the promoter is overpaid although his service may be a real one; but there is nearly as much danger of the exploitation of the investor through unreasonable engineering expenditures as through the costs of financiering. The contractor's "rake-off" is a too-familiar fact.

In determining the proper property charges during the construction period each item should be scrutinized on this basis: does the charge in question represent a condition, service, or commodity *necessary* to the initiation of the enterprise, and was the price paid a legitimate one under all the circumstances? In the case of complex properties it is probably seldom possible to secure a record in the property accounts which represents the status of the assets with perfect accuracy at the moment operation begins. The complexities and accidents of the individual case as well as the errors in judgment which are likely to occur on the part of those immediately concerned preclude the possibility of such a result. Some of these difficulties will be considered in the following sections. But certainly the test as to whether or not a particular cost is directly connected with a tangible result is no satisfactory criterion as to the legitimacy of considering the cost in question a capital charge.

Some question arises as to what particular property accounts should be charged with organization costs which do not result directly in tangible property. How should costs which are assignable to the property as a *whole*, but not to definite units, be treated in the accounts? It would be possible to charge these items on some uniform basis to the specific accounts which represent tangible property; and the rate of depreciation on the tangible assets could be altered to make allowance for these amounts. On the other hand such costs can be charged to special accounts set up for this purpose and this is usually much the best procedure. Wherever costs can not be allocated definitely to specific units of tangible property, and hence to the accounts representing these units, not only should such items be segregated in special accounts but the amount of such costs should appear in the balance sheet specifically labeled. If this practice is followed a question is at once raised as to the legitimacy of any item which seems disproportionately large. Unfortunately it is common practice to charge the various plant and equipment accounts with these general costs. The temptation to do this is strong because of the general prejudice in favor of definite tangible assets; but such a practice makes it possible to cover up unreasonable allowances to promoters, construction company profits, and actual losses under the head of tangible property. The

amount of organization and construction costs which is not definitely assignable to specific property accounts on a rational basis should therefore always be set up in a separate account. Even if the property is a simple one consisting essentially in a single important asset such as a store building it might be desirable to distinguish in the asset accounts between general expenditures and ordinary construction costs.

The classifications of the Interstate Commerce Commission prescribed for the steam railways recognize the need for such special organization and construction accounts. In the classification "investment in road and equipment" under the head "general expenditures" are found such accounts as "Organization Expenses," "General Officers and Clerks," "Law" and "Stationery and Printing." These accounts are charged with outlays which are not specifically applicable to the ordinary asset accounts.

#### DEPRECIATION DURING CONSTRUCTION

The treatment of depreciation during construction constitutes another important problem of accounting analysis. Whenever the construction period is of considerable length, physical deterioration of property inevitably takes place. The question arises as to whether this deterioration is to be considered as giving rise to the expiration of property value — depreciation, and whether this fact should be shown by charges to expense and deductions from the cost of property. If one is to be consistent with the view above stated that all outlays for commodities and services necessary to bring about the initiation of the enterprise are costs of property and hence investment, then a negative answer to the above questions must be given. One or two analogies may serve to justify this conclusion. In constructing buildings and other structures much material is consumed which is not embodied in the final physical result. Consider, for example, the "forms" necessary in concrete work. This material may be later taken down and discarded, but its cost is always considered as part of the cost of the finished structure. Again, in working up the building material, the workmen are obliged to waste a considerable amount. Raw materials are not of proper size and shape and some waste is unavoidable. Further, the

costs of the tools and machines that are depreciated or worn out in construction work are considered as a part of the cost of the property. No one questions any of these cases. Then why should the wear and tear of the permanent parts of the structure during the construction period be deducted from the cost of the property and considered as an expense? The partial decay of physical property which is embodied in the finished structure is one of the costs of construction akin to the decay of property necessary to the result but not represented in the physical constitution of that result.

Accordingly, during the construction period proper it is possible for a property as a whole to *deteriorate* but not to depreciate. At the end of the construction period a property should always stand at one hundred per cent of its legitimate cost (ignoring price changes), although its physical efficiency may be fifteen or twenty per cent less. For if a property is of such a character that its condition when complete is *inevitably* but eighty per cent of new from the engineering standpoint, then a condition of eighty per cent physical efficiency must represent a value of one hundred per cent.

A complication arises in the case of a property which, when complete, is composed of a number of distinct units. Take the case of a railroad enterprise, for example, which requires several years for organization and property construction. The completed property will be composed of tracks, bridges, buildings, locomotives, etc. Each class of property — or even each important asset item — may require a distinct account. Now suppose, for example, that twenty locomotives were purchased to haul construction trains, and that at the end of the construction period these locomotives have remaining but sixty per cent of their service life. At the time of purchase the cost of these locomotives was recorded in a distinct account. Then, although the property as a whole is at a one hundred per cent value, these particular locomotives have actually *depreciated* forty per cent (ignoring scrap value), and if the account recording the value of these locomotives is to show the correct status of these specific property items it will be necessary to credit the Locomotives account with this item of depreciation. In what account should the concurrent charge be entered? As was explained above



this item of depreciation does not constitute a property expiration from the standpoint of the property as a whole. The locomotives in question have virtually given up their value in constructing the finished property in the same manner as have the spades and other small tools used for grading. Hence, when a specific property account (or a valuation account) is credited to indicate depreciation during construction the concurrent debit should be to some other property account and not to expense. But in what property account is this debit item incident, supposing there be no general property account?

This situation calls for a special asset account, which might properly be called Depreciation during Construction. This account should be charged with all the credits to specific property accounts which represent depreciation during the construction period. In this way the status of individual property items can be accurately reflected in the accounts. If the locomotives mentioned above depreciated during a year of the construction period to the amount of \$30,000, the following entries would be necessary at the end of the year:

Depreciation during Construction . . . .	\$30,000	
Locomotives . . . . .		\$30,000

This depreciation account represents a real property item and should be maintained as a permanent asset account as long as the property as a whole (investment) remains intact. If the other capital assets become depleted the amount appearing in this account should, of course, be written down. Such an account represents a part of the amount by which the value of the entire property as a completed unit exceeds the sum of the values of its specific parts when taken individually.

Any construction cost which cannot be directly allocated to specific asset accounts gives rise to the need for a special asset account.

#### INTEREST, DIVIDEND AND TAX ACCRUALS DURING CONSTRUCTION

It was emphasized in a preceding chapter that interest in some form is involved in all transactions covering a significant period of time. Evidently, then, interest on the capital invested ac-

crues as an economic fact during the organization and construction period. This can perhaps be made clear by an illustration. Suppose that A and B, equal partners, invest \$100,000 in a business enterprise. It requires a year to construct the plant, install the equipment, and make the other necessary preparations for operation. During this time no sales are made and no income is realized, yet undoubtedly the finished plant, ready to operate, is worth more than \$100,000. It has a value of \$100,000 plus interest on \$100,000 for one year (assuming that it was necessary to place the entire amount in a non-interest bearing account at the beginning of the year). If the partners were now to sell the completed property they would certainly expect to receive something more than \$100,000; and normally the buyer would expect to give more than this figure. The partners have borne the burdens of risk and waiting for which they expected to be recompensed in later prosperous years. If they bear these burdens and forego the future prospects of the business they can reasonably expect some remuneration.

The rate of interest that would be involved in such a sale, however, would be somewhat difficult to determine in advance. If A and B had not made this investment they might have allowed their funds to remain as bank deposits drawing perhaps four per cent. As another possibility they might have invested in securities yielding seven per cent. Or it might have been possible for the partners to have left their capital in some commercial undertaking where it would have yielded fifteen per cent. On the other hand the buyer has had an opportunity during the past year to employ his capital in many alternative lines. Probably no one of these special rates would be effective in setting the value of the finished plant. The market rate of interest implicit in the competitive price for completed establishments of the special type involved would be the effective rate. If it cannot be said that there is any regular market for such properties, then the rate of interest would be determined by the higgling between buyer and seller and the special circumstances involved in the transaction.

If A and B do not sell the finished plant, however, should the year's interest accrual be recognized on their books? The first practical difficulty arising would be the determination of the

proper rate to be applied to the investment as explained above. Even if this difficulty be ignored other more serious questions rise. In discussing this query it will be convenient first to consider the entries that would be made if the interest accrual were recorded, and the general significance of such a policy.

Suppose that a rate of six per cent is used. The interest accrual during the year of construction, then, is \$6,000. This increase in the value of the plant means a corresponding increase in the equities of A and B. The entries would be somewhat as follows :

Plant (Interest during Construction) . . . .	\$6,000
A, Capital . . . . .	\$3,000
B, Capital . . . . .	\$3,000

These entries have the same effect upon the balance sheet as would an ordinary annual income item which was not distributed. Assets have increased by \$6,000, and proprietorship has increased by a like amount. In other words the first year was not a lean year at all. Income has actually accrued. Now while undoubtedly interest has accrued in a sense, would not such an accounting policy defeat the purposes for which the accounts are intended? Is it reasonable to capitalize the services of the owners themselves in determining the value of the property? The accounts are kept, it must be remembered, primarily from the standpoint of the private owners. Then should not the asset accounts show only the value of all services and commodities *purchased* by the owners, and not the value of services *furnished* by themselves? Further, to be consistent with the view that interest accruing during the operating period is not an expense but a distribution of income, it is necessary to insist that interest accruing on the investment of the owners is never a capital charge.

From the standpoint of the partners the construction period in this case is actually a lean period. No income accrues in the first year. It is expected, however, that income in later years will yield a high enough rate on the original investment to make up for the period of waiting. To accrue interest in the first year tends to obscure the actual business situation. Any such policy is a step in the direction of the elimination of the fluctuations in

the *rate* of net income. If the property account is charged with interest on investment the actual income realized in later years gives a smaller rate per cent on the value of the property than would otherwise be the case. Is it not more rational for accounting purposes to assume that no interest accrues during the construction period, and that the income earned in later years gives a correspondingly higher rate on the actual investment?

If the value of all of the services of the equities — risk-bearing, waiting and management — were considered as asset charges year by year there would be no net revenue at all in the ordinary sense. Income paid to the owner would be the price of the owner's service, the retirement of a current asset, in much the same way that the wages paid to the laborer are the price of the laborer's service. The expense for the year — the expiration of capital assets plus the value of commodities and services purchased and consumed during the period — would exactly balance revenues. (It should be admitted, of course, that there are accidental and "supra-marginal" incomes going to particular enterprises which do not in any sense represent returns for services or ability, but are rather economic "rents.") If the industrial community were organized as a gigantic socialistic enterprise the services of ownership might be purchased and entered in the accounts in the same manner as all other items. In the present situation, however, any such viewpoint in accounting seems fantastic.

To consider interest accruals or other phases of income as a part of the cost of a property, in other words, introduces into accounting the capitalization theory in an unreasonable manner. The owners of a property expect to realize a satisfactory return on the investment, it is true, but in the typical case the exact rate of return is not known and no return whatever is assured. The owners not only may not realize any income but the original investment may be lost if the enterprise is unsuccessful. It cannot be insisted, therefore, that the value of the property is increasing as time elapses because of interest accruals.

There are some further considerations on the other side of the question to be noted, however, for if the partners in the above case actually sell the completed property for \$106,000, it must be admitted that on the books of the buyer the increased valua-

tion should appear as an asset. But the property is unchanged by the sale, it might be urged, and is accordingly worth \$106,000 before the transaction occurs. Therefore it is not being insisted that a company that buys a completed property shall prepare its first balance sheet on a different basis from that used by a company that constructs its own property? This seems a rather serious objection to the viewpoint stressed above, and it can only be answered by saying again that the accounts in a particular case are kept primarily to furnish information to the particular owners involved. If a construction company builds the plant, the operating company *buys* the service of the construction company. Interest and profit are involved in this price as in every other market price. This situation is exactly analogous to the purchase of a finished machine or any other asset. The price of the unit covers all of the essential economic elements. There is still a serious question, however, as to the propriety of accruing interest in the accounts on a firm's own capital because of the lapse of time. This means putting into the balance sheet the value of a service which the owners furnish to themselves, so to speak.

The case in which interest payments are actually made to the owners during the construction period should be considered. Suppose that the partners A and B mentioned above decide at the end of the year to withdraw \$3,000 each from the joint funds. In this event, evidently, but \$94,000 would be invested in the property. The entries recording the withdrawals should be:

A, Capital	. . . . .	\$3,000
B, Capital	. . . . .	\$3,000
Cash	. . . . .	\$6,000

The amount withdrawn cannot still be considered a part of the cost of the property. Obviously if the partners had not made this agreement an additional \$6,000 would have been invested in the plant.

Similarly in the case of a corporation, dividends paid to the stockholders during the period of construction cannot be considered a capital charge. Suppose, for example, two manufacturing companies organize with exactly the same capitalizations, each company issuing capital stock to the amount of \$1,000,000.

at par. In each case it requires a year to construct the plant. Company A pays its stockholders \$60,000 as dividends for the year, company B pays no dividends. The value of the completed property in the first case is evidently \$60,000 less than in the second case. There is no way of avoiding this conclusion. Company A has no advantages marketwise over company B because of the particular arrangement made with the stockholders.

A complication arises in the case of an enterprise financed with both stocks and bonds. Bond interest accrues and is paid regularly from the date of issue if the company is not operating. Such interest accruals again are really distributions of capital. It can hardly be said for accounting purposes that the payments made to the bondholder are additions to the value of the property. A comparison between two companies is again useful in this connection. Company A is organized to build an electric railway line. Its capitalization is represented by a stock issue of \$1,000,000 and a bond issue of \$1,000,000, and while the line and terminals are being constructed interest accrues on the outstanding bonds and is disbursed to the amount of \$75,000. Company B is likewise organized to build an electric road. Its capitalization is \$2,000,000 in stock issues, and no disbursements are made to the stockholders during construction. Obviously company B will build more miles of track and have a more valuable property than company A.

The question now arises as to what particular equity is affected by such a capital withdrawal. Referring to the distinction that has already been made between stockholder and bondholder it is evident that this burden falls upon the stockholder. The stockholder assumes the larger element of risk, and consequently his equity is residual in character. The attitude of the stockholder toward his investment naturally differs from that of the bondholder. The bondholder expects to receive a definite return at certain specified times; this return is constant, neither increasing nor decreasing. The stockholder, on the other hand, does not look for a return on his investment during the construction period. For the interest lost and the risk assumed he expects to be compensated in later prosperous years. He further assumes the burden placed upon the joint capital because of the

bondholder's contractual annuity. The stockholder is willing to make this bargain with the bondholder because his later income is correspondingly increased due to the small rate allowed the bondholder.

It should be reiterated emphatically that this view does not conflict with the well-known economic fact that interest on an investment normally accrues in time, and that consequently an investment in a sense *accumulates* during the construction period. It is urged, however, that to recognize such an accrual in the accounts simply results in restricting the stated rate of income realized during operation. Such a practice is inconsistent with the theory of accounts followed in this text; and it would also seem to obscure the practical realities of the case. To the owner the investment does not accumulate during the construction period as does a deposit in the savings bank. Instead the rate which is realized during the operating period is normally enough higher to make up for the period of waiting. This rate is realized, however, during the operating years.

In the classifications of the Interstate Commerce Commission already referred to several times is found a capital account entitled "Interest During Construction." This account is charged with all interest accruing during construction on bonds and similar securities and on the investment of the stockholders as well. While this practice is contrary to the general view suggested in the foregoing discussion it should be noted that the public utilities are not on an entirely competitive basis. The rates of the railroads, for example, are regulated. In view of the fact that the investor in railroad stocks is restricted pretty largely to a non-speculative *rate* of return there is some propriety in capitalizing the burdens assumed by the stockholder during the initial period of waiting. It should further be noted that the rules of the Commission in prescribing that interest on all investment shall be charged to property are entirely logical. Interest on bonds and stocks are properly placed in exactly the same accounting category.<sup>1</sup> In a later chapter some of the special problems

<sup>1</sup> "This account shall also include reasonable charges for interest, during the construction period before the property becomes available for service, on the carrier's own funds expended for construction purposes." *Classification of Investment in Road and Equipment*, 1914, p. 39.

of this type arising in connection with public utility accounting will be discussed.

General property taxes must be paid at stated intervals whether net revenue exists or not. The state's claim stands prior to all private equities. Consequently taxes often accrue and are paid during the period of organization and construction. How shall such items be treated in the accounts? Tax payments, as was previously explained, constitute a somewhat anomalous element in the accounting system. Such items accruing during operation are not expense in the ordinary sense. Nor can tax accruals be considered as a distribution to a typical equity. Nevertheless, as has been pointed out the state virtually has an equity in all taxable property. This equity has a recurring character. It accrues during the government's fiscal period, and is extinguished when the enterprise pays its taxes only to accrue again during the next period. If this accrual were concurrently recorded in the accounts the instants of payment would be the only times at which the government's claim was not shown in the financial records. As was stated in Chapter VIII tax accruals are often recorded at all periods of closing; but this can be done accurately only when the amount of the tax can be ascertained in advance of payment.

Tax payments arising during construction are usually treated as capital charges, and little fault can be found with such a procedure. Property taxes are generally levied alike (or roughly so) on all enterprises — operating or in process of construction — of similar character and under the same governmental jurisdiction. Accordingly, unless prices are sufficiently high to cover all costs of construction — including taxes — capital will be withdrawn from the given industry until the price of the product rises to a point at which a normal return on these outlays is realized. The actual investment may then be said to include tax payments.

It should be freely admitted that practically the same thing may be said about interest accruing during construction. The price of the product in later years will normally recompense the investor for the necessary period of waiting. Again it should be remembered, however, that the accounts are kept from the standpoint of the *private* equities. Tax payments are a neces-



sary outlay, a part of the private owner's actual investment. The interest accrual, on the other hand, is simply a phase of the owner's return, arising from the fact that he makes these necessary outlays and waits for his remuneration.

#### THE CONSTRUCTION PERIOD — ILLEGITIMATE COSTS

Thus far it has been assumed that no question arises as to the definition of the construction period, but as a matter of fact this is often a serious problem. If the enterprise is forced to languish for long intervals because of the lack of capital, or if the actual construction work is carried on inefficiently, it would be decidedly improper to capitalize the costs of this delay and inefficiency. Or if unusual accidents occur and retard the construction work, it would seem unreasonable to load the value of the property with such costs.

The determination of a proper length for the construction period presents probably the greatest difficulty in the case of railroad building. The construction of a railroad several hundred miles long may require a number of years. In determining what is a proper construction period in any case, the whole situation must be canvassed. The topographical nature of the country through which the railroad passes is an important factor. All legitimate obstacles to speedy construction must be taken into consideration. It may be that part of the road will be turned over for operation before the entire line is completed. In such a case the depreciation of specific property items and similar charges made from this time on and applicable to the finished portion of the property cannot be considered as property charges, but are rather deductions from revenue.

The construction period is sometimes confused with the "developmental" period. The following case illustrates this confusion. A railroad company is compelled because of traffic conditions to change its route and abandon one hundred miles of track. The company petitions the public utilities commission that it be allowed to carry the cost of this abandoned property in the balance sheet as an asset, arguing that the cost of this abandoned line is really part of the cost of the new road. The old line is analogous to the "false-work" in a bridge — a neces-

sary step in construction; the new road is analogous to the completed bridge. This contention represents a questionable extension of the term "construction period." The interval between the time that the road was originally turned over to the operating department, and the date of the completion of the new line, might be called the developmental or experimental period. It would seem unreasonable, however, to consider the finished plant as in the process of construction throughout this entire period.<sup>1</sup>

It should be admitted, however, that it is not always easy to draw the line between construction and operation. The building of a modern enterprise is a more complex process than the mere physical construction of the property. It is necessary to do preliminary advertising, establish sales agencies, organize the operating force, etc. It would seem to be a conservative policy, however, to treat practically all such costs as operating charges as soon as revenue begins to accrue. There may then be only a small rate of net revenue earned in the first two or three years, or even no net revenue. To extend the construction period unreasonably, however, tends again to inflate property values and to obscure the actual situation.

In this connection it should be emphasized that capital may be dissipated as easily during construction as at any other time. The management of a newly organized company is naturally loath to begin business with a deficit appearing in the balance sheet; but if the balance sheet at the end of the construction period were to present the actual status of the enterprise in many cases such a deficit would be shown. The capital of the investor is not in an inviolable position during the construction period. If the construction force is not properly handled the length of the construction period is extended beyond a reasonable time, and the labor cost of the finished plant is consequently inflated. If materials are carelessly used there may be unusual waste and delay, and the material cost will be, accordingly, an unreasonable figure. Dishonesty and inefficiency are often responsible for

<sup>1</sup> Peculiar problems arise in railroad accounting, however, as was stated above, because of the fact of public regulation. Chapter XXXI is devoted to a discussion of some of these problems. In Chapter XXIV the significance of "going" or developmental value will be considered.

\* construction figures which are ridiculously high, and though all such items are usually charged to the property accounts yet this fact does not justify the practice. It is just as important that the original values set upon the assets taken over by the operating officials should be correctly stated as that later valuations should be correct.

The fact that an actual transaction has taken place and that a cost has been incurred does not of necessity mean that the outlay is a proper capital charge even if the transaction occurs during construction. If all expenditures during organization and construction are allowed as costs of property the original valuation set upon the assets may include a considerable item of capital dissipation. On the other hand any normal, necessary expenditure for commodities or services is allowable. The representative case should be taken as a basis for determining the legitimate values of newly constructed property units.

#### DISCOUNTS ON SECURITIES

The treatment of the accounts which represent the securities issued at the time of organization requires further consideration in this connection. As was stated in Chapter XIII it seldom happens that the value of the property acquired or constructed (even when all legitimate capital costs are included) exactly equals the par value of the securities issued. Usually the nominal capitalization exceeds the actual investment. This should not necessarily be considered an improper situation. It simply means that in American business finance it is somewhat difficult to issue securities except at a discount. It is customary, however, to enter securities in the accounts at par and to inflate property values correspondingly. Very frequently the par of the securities issued is taken as the basis for the valuation of the assets in the first balance sheet. The securities are placed on one side of the balance sheet at par; the asset items appear on the other side showing the same total. In other words discounts are covered up by charges to property in an attempt to validate the par value of the outstanding securities.

Such a practice is, of course, entirely improper. In such a case the sums appearing in the asset accounts may bear little

relation to the actual value of the property. The par of the stock issued is a formal fact which reflects investment only in the most general way. In a specific case it may be a fact of little importance. The reluctance on the part of the management to show a valuation item on the left-hand side of the balance sheet seems to be responsible for this practice. If the situation were understood by investors and others interested there is no reason why an item of discount on stock appearing on the balance sheet should be considered as a reflection on the financial condition of the company.

For accounting purposes a par value for stock might well be dispensed with. The importance of par value in the accounts is usually greatly over-emphasized. It would be entirely possible to issue securities which have no repayment date (such as capital stock) without a stated par value. It might be objected that capital stock without a nominal value could not be conveniently handled in the accounting records, but this is not a very serious objection. As was stated before no difficulty arises in the treatment of partnership or single-proprietor proprietary accounts because of the absence of a par value for proprietorship. Without a par value a share of stock would simply represent a certain definite fraction of the total of the stockholders' equity. It is not necessary to state a dividend payment as a certain per cent of the nominal value of the stock outstanding. The significant fact is the per cent of actual proprietorship represented by the dividend. Here again par value is more confusing than illuminating. A dividend declaration may also be conveniently expressed at so many dollars per share. It is noticeable that in some states corporations are allowed to organize without stating a par value for the capital stock.

If the par of the capital stock appears in the balance sheet the actual amount of the discount should be shown in a separate account as a valuation item. Such an item is a nominal deficit only, and does not represent a dissipation of capital; but if actual losses occur during the construction period such items constitute a real organization deficit as was previously explained. In every case the values of the assets should be determined by the legitimate costs of construction and organization without reference to the par of the securities issued.

Large enterprises frequently make use of bond as well as stock issues to secure the necessary capital as has already been explained. The par value of a bond has a greater significance than the par of a stock certificate because it represents the amount which must finally be paid to the investor. The amount of the discount is at the outset a valuation item, but the amount of the deduction declines as the liability accrues. The proper accounting treatment for items of bond discount has been fully discussed in preceding chapters, but in this connection the point should be emphasized that bond discounts constitute an adjustment in the interest rate, and must not be considered as property costs.

Many other questions arise in connection with the valuation of property during the organization and construction period. In the building of a large plant the construction accounts required may be a complex system in themselves. The valuations set upon the assets appearing in the balance sheet at the moment the completed property is turned over to the operating officials should be based on summaries of the construction records. The nature of the systems of construction records required for particular types of work is a matter of technique which cannot be discussed in this connection. An attempt has been made, however, to present some of the typical and difficult problems of analysis which arise during the initiation of an enterprise.

## XX

### THE BASIS FOR REVALUATION

IN the preceding chapter were discussed some of the typical problems arising in connection with the valuation of assets during or at the close of the organization and construction period. These problems are of importance particularly in the case of enterprises such as the public utilities which require a long construction period. Of much wider application and of much greater importance for the accountant, however, is the general problem of the revaluation of assets during the period of operation. The process of taking inventories and making appraisals at the end of each regular accounting period in many cases furnishes the manager and the valuation engineer with almost insolvable problems; and the interpretation of valuations in view of the effect of such estimates upon the accounts and the important financial statements is the crux of the work of the accountant.

The fundamental question of principle that arises in valuations concerns the *basis* of valuation. In deciding upon asset values which basis shall be used — original cost, cost less depreciation, cost of replacement, or some other kind of present value? From the standpoint of accounting this whole matter simmers down to a consideration of the relative merits of *cost* and *present value* as proper bases for accounting entries involving valuations. In referring to valuations in the preceding chapters the importance of present value as the proper basis for inventories has been stressed. It will be necessary at this point, however, to discuss this question more fully. Some considerations already brought out will be briefly reviewed and other aspects of the problem heretofore neglected will be discussed in some detail.

### THE GENERAL SIGNIFICANCE OF VALUE CHANGES

The fluctuation of values is a familiar economic fact. Depending as they do upon the manifold and variable influences

which make up the industrial situation values are unstable aspects of commodities, services, and conditions. A value fact is never a permanent fact. Prices on the market rise and fall, and the values of objects and services outside the regular market are subject to similar disturbances.

As applied to a specific business enterprise this means that the economic commodities and rights which come into the possession of the enterprise are subject to variations in value in either direction during the periods of varying length within which such items remain in the business. This statement refers, not to changes in value which naturally accrue as services are performed upon an object, but to changes due to general operating and economic conditions — variations resulting from ordinary wear and tear, unusual deterioration, obsolescence, inadequacy, and changes in prices or costs of replacement.

As a preliminary to the consideration of the significance of these value changes in the accounts it might be well to emphasize again the fact that accounting deals primarily with *economic* data — the value representations of *economic* objects and rights. This may seem obvious but it is a fact that is frequently overlooked in discussions of the functions of accounting in connection with valuations. The accounts proper show the values of things in terms of the money unit. The physical nature of an object is significant for the accountant only in that it affects the value of the object. In keeping account of properties and equities it is of course necessary to record and make use of auxiliary facts such as names of persons, dates, original-document pages, and other details; and particularly in cost accounting such subsidiary data as the number of units produced, the quantity of materials consumed, and other physical facts, are of great importance. But the most important accounting statement, the balance sheet (which — to refer again to Sprague's statement — is "the groundwork of accountancy, the origin and terminus of every account"), is a statement of values — assets and representations of ownership or equities all expressed in terms of dollars and cents. Accounting, then, deals immediately with value facts.

In determining a sound accounting policy in connection with value changes it should be recognized that an adequate appreciation of the functions and purposes of accounting is a matter

of the first importance. In a field such as accounting, where one deals with very concrete material, general theories and principles must be finally tested on the basis of their practical utility. It will therefore be desirable at this point to sum up briefly the general functions of accounting as they have been brought out in the preceding chapters.

It would be readily admitted by all accountants that it is at least the function of accounting to make and preserve a record of the so-called actual "business" transactions. An accurate, systematic, intelligible record of contracts, engagements and authorizations must be made. It is necessary to record investments, withdrawals, purchases, sales, etc. In short, any happening based upon some underlying statement such as a voucher, receipt, note, check or other original paper must be recorded and interpreted. To maintain the integrity of contracts and equities in the complex enterprise, and to fix the responsibilities of employees, such data must be carefully compiled. This is accounting at a minimum.

Anyone who is at all familiar with the status of modern accounting, however, must realize that this is only a beginning. A bare record of the so-called actual transactions occurring usually reflects the economic history of an enterprise only in a very imperfect fashion. A record of operation — the *internal* transactions — is essential. The status of commodities and services as purchased, as was stated above, is only momentarily maintained. These economic objects and rights expire and pass on into other forms. A record of these changes would seem to be an essential part of the accounting in any case.

In other words the accounting transactions of a given period may be divided into two broad classes: (1) purchases and sales and other business transfers and exchanges; and (2) accruals of cost and income.<sup>1</sup> A bare record of the first class of transactions alone would never yield a single accounting statement of real importance. The trial balance is the only conclusion arising from such information. It is necessary as was explained in a previous chapter to *adjust* nearly every figure appearing in the

<sup>1</sup> Accruals of cost and income in a broad sense include all variations in the status of the equities resulting from increases and decreases in asset values from whatever cause.



typical trial balance in order to prepare an accurate statement of expense and revenue, and an exhibit which presents the financial status of the enterprise at a given date. That is, it is the function of accounting to classify and interpret the data of the business process in terms of *distinct periods* on a rational *accrual* basis.

All accountants are agreed that accounting must go further than a record of actual transactions; and they are further agreed that all accruals of cost — including the *accrued* expirations of *all* assets — should be charged against revenues in ascertaining net revenue for a given period. Depreciation — the value expiration of assets — is not only admitted to be a proper matter for accounting record, but it is insisted that it should be booked. It is recognized that the maintenance of capital does not depend simply upon the number of property units possessed. The investment in any case is an economic fact; and unless the assets in which the investment is represented are valued on an accrual basis the equities in the investment will also be incorrectly stated. On the other hand the consensus of opinion is distinctly against the recognition of appreciation — increases in asset values — as an accounting fact except in so far as such changes appear in actual purchase and sale occurrences.

The fact that there is this array of opinion opposed to the practice of accounting for appreciation might be considered as *prima facie* evidence that there is very good reason for this doctrine, and hence that any argument against it might as well be abandoned at the outset.<sup>1</sup> This, however, would be an unwarranted conclusion. It may be that the minority opinion is right. One needs to go back but fifteen or twenty years in accounting and judicial opinion to find serious question raised as to the legitimacy of recognizing the accrued *depreciation* of fixed assets as an expense. Indeed it has taken some time for accounting opinion to develop to the point of recognizing that the operating expense of a given period is not synonymous in meaning or numerically identical (usually) with the cash outlay for the period. As stated above, however, accountants, courts and commissions are now almost unanimous in their opinion that accrued depreciation

<sup>1</sup> The weight of legal opinion also supports the view that accrued appreciation should not be booked.

should be booked as an operating expense. It seems reasonable, then, to at least raise a query as to the validity of present opinion in regard to accrued *appreciation*.

There is little question as to the logic of the case. There is no peculiar virtue in either the increase or decrease of values. Accountants quite generally admit the inconsistency of their position; but they urge that certain practical considerations justify this inconsistency. In the following sections the more important of these considerations will be discussed.

The effect of the recognition of depreciation and appreciation upon the net revenue figure was sufficiently emphasized in Chapter X. It was shown that until all value accruals in both directions are taken into account it is not possible to prepare either an accurate income sheet or an accurate balance sheet. The point was emphasized, moreover, that the maintenance of the integrity of the accounting period depends upon the recognition of all changes as they accrue.<sup>1</sup> In the present chapter these matters will be neglected, and other important phases of the problem will receive particular attention.

#### VALUATION AND MANAGEMENT

In general it may be said that all of the interests<sup>2</sup> involved in the business enterprise are furthered by efficiency in production. Efficient management is of advantage to all concerned. Accordingly one of the most important phases of modern accounting involves the uses to which accounts and other statistical records may be put to serve managerial purposes. In this section will be considered the question as to which basis for valuation, cost or cost of replacement, has the greater significance for the manager.

What is the task of management? In the broadest sense it is the function of the financial and operating managers to make the most efficient possible use of the economic resources at their

<sup>1</sup> At this point the student would do well to review the last section of Chapter X.

<sup>2</sup> As has been emphasized several times in this text it is the immediate function of accounting, in the ordinary competitive enterprise, to advance the interests of the private owners. The interests of the prospective investor or creditor, of the laborer, and of the public are, of course, involved.

disposal ; and it is generally admitted that it is from the accounts and underlying records that the general manager, in large measure, must draw the information which shall enable him to accomplish this task. To be of the utmost assistance to the manager in this connection what should the accounts show — the present significances of all assets as nearly as these facts may be ascertained or some other figures? There are at least some reasons for thinking that present values are the all-important consideration. It is not the *cost* of the building or power-unit or machine which is most significant to the manager interested in a wise utilization of available resources. It is rather the *cost of replacement* which must form the basis of his reckoning. Suppose, for example, that a machine which cost \$8,000 is purchased and installed. A little later another machine is purchased which is similar in every respect to the first machine and will be used for the same purpose. Market conditions have changed, however, and this time the cost is \$9,000. Can the manager who looks merely at original figures in such a case make rational decisions? By assumption there is no physical difference between the two units — is there any *economic* difference? Can the manager say that the capital cost of producing the product involved is less per unit in the case of the first machine than in the case of the second? <sup>1</sup> It would seem that the manager must recognize the fact that he now has at his disposal economic resources (capital) amounting not to \$17,000 but to \$18,000.

An advance in the price of raw materials furnishes a better illustration of the importance of present values for managerial purposes. Suppose that a company manufacturing special types of copper wire and cables has stocked up on raw copper in 1914 at low prices. Within six months, it will be assumed, the price of

<sup>1</sup> The retailer sometimes appears to reason in this way. He has on the shelves, for example, two shipments of canned goods which are identical in every respect but which cost seventeen cents and nineteen cents per can respectively. He now argues that he can sell from the seventeen-cent lot at a little lower figure than from the nineteen-cent shipment because he made the first purchase before the advance in wholesale prices occurred. Since the units are interchangeable such a method of pricing seems entirely irrational. It is noticeable that the merchant in such a case usually is careful to tell the customer all about the sacrifice he is making, which is in itself evidence of its unreasonableness. In fact this is generally simply a particular method of advertising. Probably in the great majority of cases cost of replacement is effective in setting prices even in the retail market.

copper has advanced fifty per cent. But the manager, reasoning from the data appearing in the merchandise accounts, argues that the company can still profitably manufacture its old product although the price of that product has remained stationary. Would this be making a wise use of the company's economic resources? Meanwhile certain other products more immediately connected with the carrying on of war have likewise advanced sharply in price. The company might well turn its attention to the new lines. Both the interests of the owners and of the community would be thereby advanced (assuming, of course, that the market at least approximately expresses the needs of the community).

It may be urged, however, that although market conditions are of importance these matters need not affect the accounts, that the manager in any case will naturally be cognizant of the situation and will act accordingly. Yet this is hardly a reasonable position since it is generally admitted that it is an important function of the financial accounts to furnish information which will assist the management in making rational decisions regarding the employment of the investor's capital. Further, it is always insisted that depreciation due to changes in market conditions should be booked.

In the case of most *fixed* assets, value declines due to the various important factors contributing to depreciation — wear and tear in use, extraordinary deterioration and damage, obsolescence, etc. — usually more than offset any possible appreciation due to changes in construction costs. And in such cases it is admitted that present value (cost less net depreciation) is the significant accounting figure for managerial and other purposes. It may well be asked: if present value is significant in these cases, why is this not the case where increasing costs of replacement have more than offset the depreciation tendency? Even if depreciation is the stronger influence, in any case it is important to notice that the appreciation tendency may necessitate an occasional revision of the *rate* of depreciation. The economic life of a freight car, for example, does not depend merely upon the ordinary depreciation factors but upon cost-of-replacement conditions as well. A particular car might last fifteen years and be scrapped at the end of that period provided there were no changes in product prices or in replacement costs. If labor and material costs

advance, however, the management may very wisely decide to use the car *twenty* years. In the revaluation of assets the accountant usually admits the propriety of allowing for price increases provided this influence does not entirely offset depreciation. This is nothing more nor less than the recognition of appreciation in a limited sense. If price changes may be allowed to revise the rate of depreciation, why should the validity of price changes which entirely offset depreciation be questioned? This is only one illustration of the way in which appreciation under present practice gets into the accounts in an imperfect fashion.

Land furnishes an important exception to the general rule that the fixed assets are subject to net depreciation. In general all land properties rise in value with the industrial growth of the community. Is present value the significant thing here for managerial purposes? While land may not contribute a price-determining cost from the standpoint of the general market, from the standpoint of the specific enterprise land is virtually in the same category as capital. Those economists who have attempted to extend the concept of capital to include land have always argued from this viewpoint. The manager, then, considers land as of essentially the same character as any other asset—a part of the capital cost. In determining what economic resources are being devoted to a particular end land must then be taken into consideration; and if present values are not recognized the accounts will not be of much service in this connection. *Economic* resources are always measured in terms of present values.

It is sometimes objected that if a factory site, for example, appreciates because of an advance in the prices of contiguous property, it does not add anything to the physical efficiency of the site for manufacturing purposes, and hence the increment should not be registered in the accounts.<sup>1</sup> This objection appears to involve the old confusion between utility and value, or, at least, is based on the failure to appreciate the

<sup>1</sup> Montgomery in his "Auditing" takes the position that in the case of land cost should always be shown in the accounts whether present value is lower or higher on the ground that an appreciated or depreciated site is no more nor less valuable for the specialized purpose to which it is being put than it was when purchased. This

fact that accounting deals with economic data. If all similar sites have risen in value, an advance in the price of the product will accompany this change. If only the value of a particular site has increased, due to conditions entirely outside of the industry involved, this fact should be recognized in the accounts so that the management may realize the situation, and either make more efficient use of the property or move the enterprise as soon as feasible to a cheaper site. It is largely due to the recognition of such value changes that the continuous shifting of economic resources so essential to general industrial welfare is accomplished. In the case of the appreciated factory site it is evident that a piece of land is being devoted to a purpose for which it is too valuable — either from the standpoint of public or private interest.

This point can be made emphatic by the consideration of a rather extreme case. In a certain large city a small weather-beaten structure used as a repair shop is located in the "downtown" district, surrounded by modern buildings. The site was purchased many years ago for about \$1,000. On the basis of the value of contiguous property the site is now worth about \$25,000. Should the owner of the shop consider the land as still worth but \$1,000 on the ground that this is the cost figure and that the site is no more valuable for his purpose than it was formerly (assuming this to be true)? Would not such an opinion

is at least a logical standpoint but such a view denies that it is the function of the accounts to show economic facts. Montgomery's argument against the validity of recognizing an increased valuation in land is interesting. He urges that not only is an increase in site values not a benefit to a manufacturing company but it is an actual detriment because of the increased taxes which are likely to follow. In much the same sense it might be said that any increase in capital costs is a detriment. If it costs \$2,000 more to replace a machine than the original cost of the unit removed, it is clear that the capital cost of producing the commodity or service involved has increased. It is just such facts, however, which the management wishes to know and which should be shown by the accounts. Similarly if an asset declines in value this fact should be recognized, although the physical efficiency of the asset may be as great as before. Obviously a once valuable tract of land might become worthless because of industrial and market changes, although its usefulness for the particular purpose for which it was secured were unimpaired. If an item has actually lost its economic character it no longer represents a part of the capital of the business and may be entirely omitted from the balance sheet. It should be noted, however, that in a few cases an item may have an actual economic significance to a particular enterprise, although it has no general market value.

be entirely irrational and impractical, and be judged as due to obstinacy or other eccentricity?

Another phase of the relation between management and the accounts lies in the uses to which the records may be put by those ultimately in authority in determining the efficiency of the operating officials. The accounts can be made an effective tool in fixing the responsibilities of the manager and other employees, and may be used to some extent as an index of efficiency to guide the directors and owners in their judgments. It was suggested in Chapter X (page 242) that in some cases this can be more effectively accomplished by the recognition of appreciation. Another illustration will be given at this point. During 1914, A, it will be assumed, is manager for the X Co. The war interferes with sales and hence there is a poor showing of revenue. A, however, stocks up with raw materials during August and September at very favorable prices. By December business has revived somewhat and the prices of materials have advanced. It would now cost the X Co. \$200,000 additional to buy its stock of materials. The directors, however, dissatisfied with A's showing dismiss him and engage B. During 1915 the business revival continues, and B makes an exceedingly favorable showing of net revenue for the year. Of this amount \$200,000 is clearly due to A's foresight. If these accounts are to be used to reflect managerial efficiency it would seem that appreciation of materials to the amount of \$200,000 should be credited to the revenue of 1914. (This situation, of course, is a special case. The manager may or may not be responsible for unusual gains or losses.)

Much more might be said concerning the significance of present values for general managerial purposes. The suggestions made would seem at least to raise a substantial query as to the reasonableness of keeping *accrued appreciation* out of the records. Can the manager intelligently choose between methods, processes, machines, products, on the basis of historical figures? Should he not base his decisions upon a recognition of the present significance of all commodities and services available? And if the accounts are to be used by the manager — should not this information be presented in the accounts?

## THE MEASUREMENT OF INVESTMENT OR SACRIFICE

An objection to the recognition of appreciation in the accounts to which particular attention has been directed in discussions of public utility accounting and also of general accounting is based upon the contention that the accounts should show cost figures because cost represents the investment or sacrifice of the investor. The validity of this viewpoint may be questioned on two bases. In the first place cost figures as ordinarily understood do not show the actual sacrifice of the investor; and in the second place, it is doubtful if it is the function of the accounts to present at all times original sacrifice. Each of these propositions will be briefly considered.

Original cost figures would permanently show the sacrifice of the investor only in a *régime* of static prices; and the shifting of prices is an important and familiar characteristic of the modern economic order. These general changes reflect a change — relative or absolute — in the measuring unit itself. The dollar, as is the case with all value units, is not a unit of constant significance. As prices in general advance the significance of the dollar declines and *vice versa*. Consequently, in a system of shifting prices, original cost (in dollars) does not show original sacrifice. Suppose, for example, that \$100,000 in capital is invested in a manufacturing enterprise in 1910. This means \$100,000 in terms of 1910 dollars. If in 1917 prices in general have advanced forty per cent this means — ignoring depreciation — that in terms of 1917 dollars the actual investment or sacrifice of the stockholders is \$140,000 rather than \$100,000. Thus the importance of original cost figures — as representing sacrifice — disappears in large measure in a period of changing prices. Moreover, prices are always changing. In accounting there is little propriety in the assumption of static prices.

In order to follow original sacrifices, then, it would be necessary to recognize changes in the significance of the money unit in the accounts.<sup>1</sup> But it is very doubtful if the accounts should show original sacrifice. It has been argued thus far that costs

<sup>1</sup> In *Should Accounts Reflect the Changing Value of the Dollar?*, *Journal of Accountancy*, issue of February, 1918, Livingston Middleditch suggests a way in which this may be done.



of replacement should form the basis for the revaluation of assets for accounting purposes; and actual sacrifice and cost of replacement are not likely to coincide. The change in the value of the dollar reflects *general* price changes. But it is not values in general but *specific* values which the accounts should show. The accounts of an enterprise should present as nearly as possible the actual values of the specific assets which make up its investment. Cost figures, properly adjusted to allow for changes in the money unit, give a correct expression of the original investment. Cost of replacement figures, with proper allowances for depreciation, give present values.

An illustration will perhaps serve to make the distinction between present value and sacrifice figures entirely clear. The A Company buys a shipment of raw materials at the beginning of the year. The cost is \$25,000. At this time this figure represents the investment of the owners and actual value as well. Within three months a general price movement has occurred which means a depreciation in the significance of the dollar of twenty-five per cent. This corresponds to an advance in general prices of thirty-three and one-third per cent. Expressed in terms of the new dollar, then, the above shipment of materials would have a value of \$33,333.33. This figure represents the sacrifice of the investor in terms of the current dollar. It is very unlikely, however, that the cost of replacement of this particular commodity has advanced in exact proportion to general price change. The price of the materials involved may have advanced fifty per cent, for example. The values of all commodities and services do not rise and fall evenly. A particular commodity may even fall in price although the general movement is in the opposite direction. Accordingly, if the property accounts are used to represent the values of the specific assets involved, in any case it is specific and not general price changes which are significant, and the figures which represent original sacrifice will not be maintained.

It is the function of the asset accounts to follow the capital investment of the owner as it takes shape in different units and types of property. Subject as it is to the varying conditions in the economic situation this investment may increase or decrease, reflecting, of course, a corresponding increase or decrease in

ownership. If it were true that the actual capital of the investor was not subject to change because of technical and economic conditions, then it would be the function of the accounts to show at all times original sacrifice. But this does not at all conform to the realities of the case. A given capital fund may be entirely dissipated because of business losses. Of what importance would it be in such a case to present original sacrifice figures in the property accounts? Another fund of capital may be doubled in a few years because of successful management or accidental circumstances. Similarly in this case original investment is not the proper basis for asset valuations. No fund of capital is actually static in a dynamic economic situation.

The discussion in the preceding paragraphs refers to the competitive enterprise. In the case of publicly regulated enterprises, where rates are not market prices, there are other elements to be considered in determining the proper basis for valuations for accounting purposes. The courts have held that the investor in public utilities is entitled to a "fair" return on a fair value of the property in any case. The question as to what constitutes such a fair value is still unsettled. Undoubtedly the original sacrifice of the investor is a matter of greater significance in such cases than in the case of the typical competitive enterprise. In Chapter XXXI this problem will be discussed.

#### SPECIAL OBJECTIONS TO THE RECOGNITION OF APPRECIATION

It may be said that to recognize the appreciation of either fixed or current assets is unwise because it may be necessary to revise the estimates if prices fall. This objection does not seem to be very serious because the same thing may be said of any asset value; and it may be said of original cost as well as of appreciated value. All asset values are more or less uncertain, or, in other words, are subject to revision. A factory which costs \$1,000,000 to build may become nearly worthless within a short time due to the exigencies of the economic situation; but it would not be wise, therefore, to anticipate bankruptcy and enter the cost of the structure as a deficit in the first place. It is the function of the accounts to follow just such changes. If an equity is impaired through asset losses in one year the accounts

should show that fact. If the loss is recouped in a later period the accounts should show the change and in the proper period. Business fortunes vary from year to year. The accounts should present these variations.

In this connection the importance of recognizing appreciation in order to maintain the integrity of the accounting period should be reemphasized. The emphasis upon the *period* is one of the striking characteristics of modern accounting. In order that periods may be separated sharply trial balance figures are adjusted on an accrual basis. Inventories of goods in process and finished goods are taken. Costs applicable to such goods are included in these inventory figures so that deductions from sales for the period will not be overstated. Similarly revenues are accrued. It is considered to be good practice in contractors' accounts, for example, to apportion sales figures over the entire period of construction. All of these accruals are recognized to maintain the integrity of the period. To carry this procedure to its logical conclusion it would seem reasonable, then, to accrue appreciation of raw materials, for example, instead of waiting until a sale is made.

Another argument always raised against the practice of appreciating unsold assets is that such a procedure anticipates profits. (See Chapter X.) This argument is entirely fallacious. To use selling prices in taking inventories — in other words to capitalize the services of the firm before those services are performed — is to anticipate profits. To recognize changing capital costs and equity changes due to the appreciation of working or fixed assets is an entirely different thing. Suppose, for example, that materials on the shelves cost fifty cents per unit and that cost of replacement becomes sixty cents. This is appreciation. To inventory these materials at eighty cents — selling price — would be to forecast profits.

This argument comes up in various forms. Sometimes it is said that appreciation is "unrealized profit." This is again unsound. Suppose that an individual owns a bond and that it advances in value. The profit has been realized in the ordinary accounting sense although a sale has not been made. All accruals are, of course, based on "unrealized" transactions. Accruals of cost in connection with goods in process and finished goods, and ac-

cruals of revenue in connection with an industry like shipbuilding are all in this class. None of these accruals are yet realized in cash. On the other hand a revenue realized in cash may not be a revenue within the period covered by the cash transactions. A railroad company, for example, sells excursion tickets in one month and takes them up in the next. The revenue accrues as the service is rendered. This objection seems to be based on the old fallacy that a profit must be available in cash before it can be recognized.

Again it is contended that appreciation is only an estimate and hence that it is not practicable to recognize it in the accounts. In answering this objection it should first be roundly emphasized that accounting deals primarily not with absolute certainties but with estimates. Every valuation is an estimate.<sup>1</sup> All inventories are estimates. Depreciation is purely a question of estimates, and yet no one argues that accrued depreciation should be omitted from the accounting records.

As a matter of fact, moreover, the value of an appreciated asset can be estimated more accurately than a valuation taken on any other basis. In the case of land appreciation, for example, the market for contiguous property gives a fairly reliable indication of the present value of any particular site. But to estimate the depreciation of a factory or a machine is the most difficult problem in accounting. Such a valuation is largely guess. There is no reliable market for second-hand factories. Similarly in connection with working assets and other current items, present values in the case of advances are easily ascertained. The current wholesale prices for materials, for example, can be determined on as reliable a basis as can actual invoice prices. The value *expiration* of merchandise due to deterioration and shopwear, on the other hand, is very hard to measure.

In this connection it may be further objected that present value has so many different connotations that it does not form a reasonable basis for valuations. Present value, for example, may mean a possible cash liquidating value or it may mean the

<sup>1</sup> In this connection it may be noted that the practice of some auditors who spend a great deal of time endeavoring to locate a small error in the trial balance, and then readily certify to valuations in the balance sheet involving hundreds of thousands of dollars is somewhat unreasonable.

cost of replacement. The idea of the "going concern" has considerable significance in this connection. Usually it may be taken for granted that the enterprise involved will continue to operate, buying materials and selling finished goods, and that therefore the cost of replacement value is the significant thing. As a rule cost of replacement is higher than the amount which would be received at a forced sale. In the case of such assets as securities, however, liquidating value and replacement cost are essentially the same. The "kind" of present value to be used in making valuations depends upon the condition of the enterprise and the purpose of the valuation in any case. It is usually not very difficult to come to a rational decision. Valuations on a cost basis furnish much more difficult problems of analysis as will be explained in the next chapter.

In the same vein it may be urged that to introduce hypothetical values into the accounts is not a reasonable procedure in itself. This point can be made in a particularly effective way in connection with the revaluation of a fixed asset such as land. Can the values of contiguous property be used as a proper basis in revaluing a factory site? The factory site will probably not come into the market at all for years. The sales of contiguous property may be for residence or other purposes. Do these sales necessitate a revision of the value of a site used for an altogether different purpose? The valuation of a railway right-of-way furnishes a still better case. Should a railroad company's real estate accounts be revised to allow for the appreciation of contiguous property which is used for altogether different purposes? Does the probable cost of replacement — a purely hypothetical situation — have anything to do with the actual value of the railway's land properties?<sup>1</sup> Can one reason from the market, by analogy, to the values of units in use?

As a general answer to these questions it may be said that the market apparently represents the actual economic situation, and as such it furnishes a standard of value measurement which must never be lost sight of. The market is always admitted to be the proper test when prices decline (price declines constitute a phase of depreciation) and there is no reason for supposing that it is

<sup>1</sup> In rate-making cases the courts have sometimes held one way, sometimes another, on this proposition.

not of importance as a means of determining value increases. In the case of the factory site mentioned above and in similar problems, however, it should be admitted that even the bona fide values of adjoining tracts cannot always be considered a satisfactory test. If a highly specialized plant is built upon the site, the whole property constitutes an inseparable unit. The values of plant and site are joint. This situation may virtually remove the site from the land market for years. If there is no reasonable *possibility* that the investor can take advantage of this market it virtually does not exist for him.

It may be further contended, as was noted in Chapter X, that although appreciation means an increase in property and consequently an increase in property rights, the amount of this increase is in no case available for dividend appropriations and consequently should not be recognized. This argument is another phase of the old idea that profits must be available in liquid assets in order to be considered as profits. As a matter of fact the cash with which to pay a dividend can be secured on short-term notes or otherwise. Often corporations find it necessary to borrow for brief intervals to make dividend payments, because dividend dates do not coincide with the times at which the cash balance is large. Net revenue due to appreciation is just as available as is net revenue tied up in any asset other than cash. Net revenue *once* realized in cash may not be so available at the end of the period, but may be represented then by new equipment and merchandise. Even if cash is available it does not always indicate a rational possibility of dividends. The cash may be original *capital*, temporarily in liquid form. Dividends depend primarily upon the showing of net revenue and general credit and financial conditions, and not upon the condition of the cash account.

A final objection — probably the most significant — to the thesis that value changes in each direction should be recognized in the accounts is that such a practice savors of non-conservatism; it opens the doors, it may be said, to all sorts of inflation; it enables the manager to make any showing he pleases, etc. This objection undoubtedly has some force, but it is hardly conclusive. A clear distinction should be made between conservatism and downright concealment. The tendency toward overstatements

is not necessarily fostered by the adoption of a consistent policy in valuations. Why should a rational mode of thinking be expected to lead to vicious practices? Further it must be remembered that there are all sorts of ways of juggling accounts, in the absence of governmental restriction, without resorting to an illegitimate use of appreciation. Making inadequate depreciation charges, charging repairs to capital and similar practices, lead to overstatement. Government regulation of some kind is essential if accounts are to be standardized and illegitimate practices prevented. The present illogical attitude of accountants (and of the courts) in regard to asset valuations cannot be expected to do much in the way of promoting sound and conservative accounting practices. \*

Consider this question of conservatism from the standpoint of the auditor who is preparing a balance sheet — the statement of a company's financial condition. The nature of this statement is a matter of great importance. In many cases directors, stockholders, bondholders, prospective investors, bankers, credit agencies and other interests see nothing but the summary statements and base their conclusions upon these statements. To serve these various interests best how should the balance sheet — the most important financial statement — be prepared? There would seem to be some reason at least for making the balance sheet what is implied — *a correct statement of all the assets and equities in the enterprise as on a given date*. What does the investor wish to know? Certainly he is interested in the actual status of his investment. What does the prospective creditor wish to know? Certainly he is interested in the actual status of the assets and the distribution and extent of the ownership. Now it is evident that every misstatement of an asset means a corresponding misstatement of the proprietor's equity at least. Overstatements of assets by means of fictitious intangibles, inadequate depreciation charges, maintenance charged to capital, the capitalization of discounts and losses, etc., have long been considered improper because of the fact that everyone concerned is misled by such practices. Any number of actual cases might be given to show that such accounting procedures jeopardize general success and impair specific equities. *Understatement of assets* is a hardly less reprehensible practice. Such a practice

leads to what are called secret reserves. The impropriety of such accounting has also been stressed by accountants. The defrauding of minority stockholders and income bondholders, and the other questions of equity that arise have been emphasized in many recent works on accounting. The commendable outcry against secret reserves, however, should be carried one step further. Ignoring the appreciation of unsold assets which results in an understatement of assets and a corresponding misstatement of equities — is simply another method of building up secret reserves; and it is essentially as misleading a practice as the charging of capital outlays to expense.

To insist that inventories in certain cases must be taken at a figure far below the actual values in order to prevent a general overstatement of assets is from the accountant an admission of incompetence. Is there any reason to think that an understatement of the materials inventory by \$100,000 will just offset overstatements in other connections? Why should not each item in the trial balance be handled on its merits? In making adjustments why should one not be *consistently* conservative at all points? If certain of the accounts receivable are doubtful pare the item to the bone. If the discarded machinery in the store-room has a very dubious value put it on at the nominal sum of one dollar. But when the actual present value of an asset is definitely known, is there any reason for concealing a part of the item because its present value is above cost? Should the inventories of actual assets whose values are capable of almost exact determination be understated?

The point was emphasized in Chapter X that the recognition of appreciation need not obscure cost figures. Special accounts may well be used to represent any such items. If it is desired such value increases might be kept out of the operating accounts. Similarly in the balance sheet special asset and surplus accounts may well be used to represent appreciation. Certainly if the income and balance sheets are prepared on the basis of cost figures (or market if market is the lower) a supplementary statement setting forth the actual status of the enterprise should be attached. Accounts and statements which take into account *all* value changes would surely seem to be of more practical use to all parties concerned than records prepared on any other basis.



## XXI

### THE VALUATION OF SPECIAL ASSETS

WHICHEVER basis for valuation, cost or cost of replacement, is decided upon in a particular case, the physical inventories and appraisals must first be taken. The units of certain kinds of property must be counted or measured. Estimates and appraisals are necessary in the case of complex assets such as buildings. Computations and adjustments are required in the valuation of rights such as promissory notes. The taking of inventories is evidently not entirely an accounting problem, but the accountant should be familiar with the general rules to be observed and must be able to decide in a particular case as to whether or not sound principles are being followed. In this chapter a brief discussion of the valuation of particular assets will be given.

#### CASH AND RECEIVABLES

The values of all assets are measured in terms of money, and hence, as was explained in a previous chapter, the problem of valuation really does not arise in the case of cash. In other words the trial balance cash figures are usually also the balance sheet figures. If cash is lost or stolen deductions must of course be made; but the physical inventory at any rate is identical with the value inventory since cash is measured in terms of itself as so many dollars and cents. This statement assumes, however, that all kinds of money in the community are circulating freely at par or face value. Where paper currency becomes depreciated it is necessary to value such money in terms of the standard currency. In the early days of banking in this country the valuation of the bank notes in the till was about as troublesome a problem as the valuation of a miscellany of shopworn goods.

Instruments such as personal checks, cashiers' checks and drafts, postoffice and express money orders, etc., are commonly treated as cash when received or paid. Since such cash equivalents form a large part of the regular medium of exchange it is legitimate to treat such items as cash, although they are not legal tender. Deductions from the face amounts due to exchange and taxes, however, must sometimes be made. Further, a particular check may of course be worthless because the drawer has insufficient funds on deposit. Such a situation is usually discovered after the drawee has deposited the check at his bank and has charged the item to his cash account. In this connection it should be remembered that a large part of a firm's cash so-called is simply a highly liquid account receivable against some bank. Such a fund is consequently not cash in the strictest sense and is subject to a small element of risk.

In taking the cash inventory at the end of the accounting period, cash on hand must be carefully counted and added to the sum on deposit. Any cash equivalents should be carefully scrutinized and memoranda which do not represent cash at all should not be included. The cash item as it appears on the balance sheet is often seriously inflated by the inclusion of fictitious items. Generally cash is so safeguarded in the case of businesses of much size that practically a perpetual inventory of cash is available.

Accounts receivable are one of the most important kinds of current assets in many lines of business. Such accounts usually arise, as was previously explained, from the sale of goods on credit. In a sense an account receivable is not property at all, but a claim to property. Such rights, however, are considered as assets in the accounts, and because of their liquid nature such receivables are one of the best assets from the standpoint of creditors. From the accounting standpoint rights to property constitute assets and this class of assets includes a wide variety of items. Securities of all kinds are rights. In much the same sense money is not property but only a highly negotiable claim to commodities and services.

With hardly any exceptions the face of the accounts receivable outstanding at the end of any accounting period should be depreciated, as experience has demonstrated that not all cus-

tomers can be expected to pay their accounts. This is particularly true of the retail trade, but it is also true in other lines. Bankruptcy is a common occurrence and the creditors of insolvent firms lose large sums on the open book accounts involved. There are two possible methods of procedure which may be followed in valuing accounts receivable. Each account may be valued on its merits or a certain per cent may be deducted from the outstanding total. In the first case the size of the account, the length of time it has run, the financial prospects of the customer, and similar factors would be taken into consideration in deciding upon a proper value for the account. This detailed method of inventory would be advisable in some cases, particularly where a few large accounts only were outstanding. Usually, however, experience furnishes a test which can be relied upon. The merchant finds, for example, that on the average five per cent of the face of the accounts incurred is never paid. At the end of each accounting period, then, an amount equivalent to five per cent of the face of the outstanding accounts *arising within the past period* should be charged against revenue and credited to an appropriate valuation account. The proper entries for such cases were shown in Chapter VIII. In most cases more accurate estimates of the revenue deduction can be made in this way than would be possible if each individual account were appraised. If the business is large enough the amount of worthless accounts can be as accurately estimated as can the total fire loss in the case of a large number of buildings. To select the specific accounts which will not be paid, however, would be almost as difficult as to pick out the specific buildings which will be burned.

Items are sometimes included under the head of accounts receivable which have a doubtful character. Pending railroad claims, accounts in dispute, withdrawals by partners or directors and other questionable items are sometimes thrown in with regular customers' accounts. This is not a desirable practice. In taking the inventory only bona fide accounts should be treated as receivables. Assets which are at best contingent in character should not be included, and loans to owners themselves are a type of asset which should always be isolated.

As was stated in another connection, interest usually does not

explicitly arise in connection with book accounts. Although implicit interest may be involved it would not be desirable to attempt to write down such receivables as customers' accounts because they are due in the future. The intervals involved are usually short; and the theoretical advantages arising from such adjustments would be more than offset by the clerical disadvantages. There is some question, however, as to the propriety of valuing accounts at their face when cash discounts and other deductions may be allowed at the time of settlement. If such potential discounts are large in amount it might be desirable to charge revenue with an amount sufficient to cover the probable deductions and to credit an appropriate valuation account. This is not done as a rule, however, and month by month the error does prove to be a very serious one.

The importance of making a reasonable allowance for doubtful accounts at the end of each period and the effect of such a deduction upon the accounts and statements has been sufficiently emphasized in preceding chapters.

Promissory notes and similar receivables are also subject to depreciation. The accrued deduction may be estimated in much the same way as was just explained for accounts receivable. The payment of a note, however, is somewhat more easily enforced than that of an account and hence the rate of depreciation is not as high as in the case of open accounts. A note is a written promise to pay, and hence is a *prima facie* evidence of indebtedness. An account is only a tacit promise, and it is often difficult to produce satisfactory evidence of indebtedness. The value of a note depends, naturally, upon the integrity of the maker and general financial conditions.

In the case of notes the due date is definitely known and the rate of interest involved is either expressly stated or it can be exactly determined. In the case of interest bearing notes the accrued interest is set up as an independent asset. In the case of non-interest bearing notes the interest accrual increases the discounted value. The process of taking inventories of such securities on a mathematical basis was fully discussed in Part Three.

It may be assumed that the market for accounts and notes is so imperfect and restricted that the question as to the proper

basis for valuation does not arise. As a matter of fact notes are often highly negotiable, and changes in the rate of interest actually affect the values of such assets.

#### MERCHANDISE AND GOODS IN PROCESS

Merchandise and finished goods, materials, supplies, and goods in process furnish much more difficult problems of valuation than arise in the case of the receivables. The first question to be considered in connection with the valuation of such current and working assets is the treatment of the various items which make up the total cost.

The retailer, for example, buys a shipment of merchandise. The invoice price is \$1,000. This price, however, does not include the freight which the buyer, it will be assumed, must pay. It does not include the cost of drayage, the cost of uncrating and unpacking, or the expense of shelving and otherwise preparing goods for sale. The value of the merchandise on the shelves, evidently, is the sum of all of these items, \$1,200, it may be assumed.

The merchant sometimes neglects this analysis and charges the additional costs to expense as they are incurred. Unless the inventory at the end of the period, however, includes a proper percentage of such costs, the value of merchandise on hand will be understated and net revenue will be correspondingly misstated. One method of making the necessary adjustment in such cases was explained in Chapter VIII. The theoretically exact procedure would be to charge the merchandise or materials accounts with such additional expenditures as they are incurred. If this is not feasible because of the fact that the amount of operating outlays such as labor and other costs applicable to the asset accounts cannot be conveniently determined day by day, the division of charges might be made at the end of the period. At that time the proper proportion of the debit balance of the Wages account, for example, could be credited to that account and charged to Merchandise Inventory. The balance of the Wages account would then be closed into Expense and Revenue. Whatever accounting procedure is adopted the inventory of

merchandise should certainly not be understated by the omission of legitimate costs.

This problem of cost allocation arises still more emphatically in factory accounting in the case of goods in process and finished goods, as was stated in Chapter VIII. Goods in Process must not be inventoried simply on the basis of the value of the materials used. A proper percentage of all the costs of operating the plant should be included in the inventory. Finished goods should be valued on the basis of an apportionment of all the costs with the exception of those expenses peculiarly incident to the selling end of the business. If the entire business process from the purchase of raw material to the delivery of the finished product were considered as a single process, the total cost incurred, including selling and administrative expenses, might be divided in some arbitrary way between the manufacturing and selling phases of the business. A certain per cent of the total might then be included in the finished goods inventory.

The taking of inventories of goods in process and finished goods is essentially a part of the general problem of cost accounting. This is not the place to go into a detailed discussion of cost methods, but the above statement should enable the student to recognize the significance of cost accruals in valuations.

Since the prices of such assets as materials and merchandise are subject to market fluctuations the question arises as to whether cost or cost of replacement is the proper basis for valuations. In any case an inventory must be taken to determine the number of units on hand, but in finding the value inventory a decision must be made as to the proper price per unit to apply to the physical inventory. In general accountants adhere to the rule that cost prices should be used unless market prices are lower, in which case market prices should be used. This rule is evidently not in agreement with the general view developed in the preceding chapter; and it would require some very important practical considerations to justify such an illogical procedure. Why should the cost of replacement or market price be the proper basis for valuation in one case and not in the other? What considerations justify a shifting from one basis to another?

The rule adopted is evidently conservative in that the lower

of the two important figures is always taken and it is usually justified on this ground. As a matter of fact such a principle of valuation does not insure conservatism. Conservatism is enforced only by sound reasoning, integrity, and governmental regulation. As has been pointed out by several writers a manager interested in making a favorable showing might easily use an illegitimate cost figure in taking the inventory. A small shipment might be purchased at an unreasonable price and this figure might be applied to the entire inventory. Unless cost prices are on a strictly competitive basis inventories at cost may be inflated. Similarly in using cost of replacement as a basis for valuation an illegitimate figure may be used. In other words, whichever basis for valuation is nominally adopted, it is possible for a careless or dishonest manager to inflate inventories.

The above statement that a manager may take an unduly high cost figure and apply it to all goods on hand suggests one of the most serious difficulties facing the accountant who insists upon cost or market, whichever is the lower, as the proper basis for inventories. In a changing market the goods on hand will usually have been purchased in several lots at several different cost prices. Suppose that all of these cost figures are below the present market price. How is the inventory to be computed? It is usually said that a weighted average cost should be used. This rule, however, only apparently avoids the logical difficulty of setting several prices upon similar units in the same situation. This may be shown by an illustration.

Suppose that a coal dealer is taking an inventory of coal on hand. During the past period he has purchased three shipments of a particular kind of coal at \$4, \$5, and \$6 per ton respectively. There is now on hand 1000 tons of each shipment. The average unit cost is evidently \$5 per ton. On the basis of this figure the inventory amounts to \$15,000. This, however, is exactly the same figure that is obtained by valuing the three lots of 1000 tons each at \$4, \$5, and \$6 respectively and adding the totals. In other words, the use of the average unit cost in taking inventories gives exactly the same results as the valuation of each lot on hand at its actual cost. If cost rather than cost of replacement is used as a basis for such valuations there is no way of

avoiding a rather ridiculous violation of the law of single price. If this illogical procedure is adopted, there is evidently no advantage to be gained from the determination of an average unit cost as far as the taking of the inventory is concerned. Each lot may be valued on the basis of its actual cost without further computation.<sup>1</sup>

The discussion of the valuation of merchandise and materials has thus far ignored the question of possible depreciation due to shopwear or other deterioration, and to obsolescence. Such depreciation, however, is a serious possibility. The management is often reluctant to admit that such value declines have occurred, but an important cost in many lines of business is due to depreciation from these causes. Adequate deductions from revenue should be made to cover such expirations. It is exceedingly difficult to accurately estimate these changes, and in view of this fact the allowance should be liberal. The concurrent credit entries may be listed in the merchandise accounts or in an appropriate valuation account.

As was explained in a preceding chapter it is customary to enter merchandise and similar assets in the accounts at the gross invoice price. When discounts are taken the amount of such allowances virtually constitutes a deduction from the cost of goods purchased. A question arises as to whether in taking the inventory any deductions should be made from the value of goods on hand to cover possible discounts. If the amount of the possible discounts is large some deduction on this account should doubtless be made. Usually this adjustment is ignored and although this procedure is incorrect the amount of the error month by month is small.

#### MACHINERY, BUILDINGS, AND LAND

Fixed tangible assets such as buildings and machinery furnish difficult problems in valuations. Such assets are purchased by a business to be used in operation and not to be resold as is merchandise; nor do they become physically embodied in the final product as do raw materials. As was admitted in the preceding

<sup>1</sup> This discussion is not intended to imply that an average of prices is not a useful figure in connection with inventories and purchases.



chapter, cost less depreciation due to causes the effect of which can be calculated with a reasonable degree of accuracy is a fairly satisfactory basis for the valuation of such assets. Especially is this true as long as advancing costs of construction do not offset depreciation entirely. An enterprise in buying a fixed asset such as a building has thereby committed itself to a definite policy. Within certain limits changes in the prices of labor and materials do not affect the value of the individual specialized structure. As far as the particular business is concerned, such changes may have no immediate effect upon the price of its product; and the owners are not in a position to act upon the apparent changing capital cost and convert their capital to another use. Only as the building becomes unfit for use through operation — unless conditions change very decidedly — can the capital fund involved be withdrawn. In other words, it is somewhat doubtful if market prices can be said to affect the values of fixed assets in use in any definite fashion.

The recognition of appreciation due to changing construction costs in connection with fixed assets is then not as important as in the case of current assets already discussed. The changing market prices of materials and merchandise usually are reflected almost immediately in the price of the product. The appreciation of such current assets is therefore a fact of immediate significance. In the case of assets such as securities the market price may be identical with the value of securities held without any question, as was explained in Chapter XVIII.<sup>1</sup> On the other hand it should be recognized that serious changes in construction costs do affect the values of such assets as machinery and buildings in the long run; and such changes must be recognized by the management if the capital of the investor is to be used to the best advantage. It may be highly profitable, for example, to remodel an almost new building so that it may be possible to shift from the production of one commodity to another even if the price of the old product is high enough to yield a fair return on the *original* cost of the plant.

While in principle, then, it may be said that market changes affect the values of fixed and current assets alike, it may be

<sup>1</sup> The regulations governing banking companies, for example, usually require such institutions to value their securities at the market.

expedient to ignore minor fluctuations in the construction costs of fixed assets for a period of years. A serious price movement in either direction, however, should be recognized. At least the management must be cognizant of such a change if wise decisions in regard to replacements and reconstruction are to be made. Further, in order to present the correct status of the investment in the balance sheet a significant depreciation or appreciation due to price changes should be recognized in the accounts.

The problem of cost allocation also arises in connection with the valuation of fixed assets. The value of a machine purchased and installed, for example, includes the invoice price, transportation charges, and installation costs. If a company constructs its own plant and equipment it may be necessary to set up some special asset accounts which represent the amount of expenditures applicable to the property as a whole but not to individual asset accounts as was explained in Chapter XIX. Wherever costs can be accurately allocated, however, they should be apportioned among the plant and equipment accounts.

A question sometimes arises as to the valuation of a single property unit constructed by an operating company for its own use. Suppose, for example, that a manufacturing company constructs a power unit at an actual cost of \$15,000, and that this same unit, purchased on the market and installed would cost \$15,500. Which amount should appear in the company's property accounts? This is essentially the problem of interest during construction already rather fully discussed. The conclusions reached in Chapter XIX can be applied to this case. The proper asset charge is \$15,000. There is no good reason why the company should capitalize its own service and accordingly accrue interest and other phases of income on this asset. The company is a constructing as well as an operating company. The rate of return it secures is larger during the period of operation than would be the case if the asset had been constructed by an outside company. It is the function of the property accounts to show the actual investment of the owners, not the amount which the investment would have been if the property had been purchased elsewhere. To increase the value of the property by accruing interest on the actual investment not only means the recognition of revenue before there is good evidence

that revenue has accrued, but it also alters the rate of return finally realized in such a way as to obscure the realities of the case.

On the other hand, it is important that all costs actually incurred in the construction of the property unit mentioned above should be charged to the property account. The value of all the materials furnished and labor utilized is a capital charge. Further, a portion of the ordinary expenses involved in running the regular power plant which furnishes the necessary power for construction operations, as well as a portion of the depreciation of the power plant, should be credited to the regular expense accounts and charged to the new property account. That part of the total expense of operating the plant which is allocatable to the construction of the new unit should be charged to property. If all of these costs are determined and charged to property the difference between the construction cost of the finished unit and its market price should approximately equal the profit of the ordinary construction company. An operating company, evidently, will not construct its own equipment unless there is some such difference.

The depreciation of such assets as buildings and machinery may be determined by actual appraisals at the end of each accounting period, or these charges may be determined in advance by setting up a schedule which apportions total cost over the estimated service life. In the next two chapters the problems of depreciation accounting will be fully discussed.

The distinction between maintenance and improvement of plant and equipment is not always easily made, as was explained in Chapter X, for the actual circumstances of each case must be investigated in coming to a proper decision. Unless a particular charge is quite evidently a value improvement it is a conservative policy to consider the item a repair. The accounting for repairs and renewals will be discussed in the next chapter.

Land values are often left on the books for long periods without change. This practice is in general justifiable unless very serious changes in the value of contiguous property occur. It is particularly true of land properties that the capital involved cannot be withdrawn readily in response to market changes. Hence there is some question as to the importance

of the market. As was explained in the preceding chapter a tract of land which is the site of an expensive plant is almost inevitably connected with a particular line of production for years. It can hardly be said, therefore, that market changes actually affect its value except in the long run. Fluctuations in land values may then be safely ignored unless the change becomes so serious as to make it possible or expedient to change a business policy.

This statement is only true in the case of factory sites, railway rights-of-way, and similar tracts. The values of lands which are held by realty and development companies, and of timber tracts, mining properties, residence lots, etc., are affected directly by market conditions, and to ignore price changes in such cases is a somewhat questionable procedure.

Lands may be acquired by cash payment (or an equivalent) or by the issue of securities. It was stated in a preceding chapter that in such cases the property account is often charged with the par of the securities issued, though such transactions lead to large inflations in the asset accounts since securities are often issued at a discount and the par value in such a case may bear little relation to the actual cost of the property. The property accounts of corporations, accordingly, often show overstated land values.

The valuation of fixed assets such as securities was sufficiently discussed in Chapter XVIII. The fixed intangibles and their valuation will be considered in Chapter XXIV. Deferred assets, such as prepaid insurance and similar rights to services, present no very difficult problems of valuation. The treatment of such assets was briefly considered in Chapter X.

## XXII

### THE DEPRECIATION ACCOUNTS

THE revaluation of assets for balance sheet purposes, as has already been suggested, presents many complex problems. Particularly is this true of the fixed tangible assets which are used for a rather long period of years and which must have frequent repairs to maintain them in a condition suitable for efficient operation. Between the date such an asset as a piece of machinery is purchased and the date that it is sold for scrap or junk, for instance, there are no market tests obtainable for inventory purposes, and yet valuations must be made if the balance sheet is to be of service as a statement of condition or the expense and revenue sheet as a correct statement of operating results for each accounting period. It is the purpose of this chapter to raise some of the questions in this connection and to explain the nature of the accounts commonly used for recording the data concerning maintenance and depreciation.

### THE DEPRECIATION PROBLEM

It might be well at the outset of this discussion to explain in brief why the problems of maintenance and depreciation are commonly restricted to the fixed asset group of accounts. An important characteristic of the current assets, particularly the current tangibles, is that units of such property are completely consumed in giving off a single service. Consequently the amount of such property consumed may be easily measured. Thus the number of pounds or tons of coal consumed may be determined by physical measurement, and the *value* expiration may be obtained by multiplying this figure by the cost per unit.<sup>1</sup>

<sup>1</sup> To bring out the essentials of depreciation accounting it has seemed best to ignore, for the most part, the problem of price changes.

Similarly the amount of raw materials or merchandise consumed may be determined by inspection (counting, weighing, measuring, etc.) and this amount multiplied by the cost per unit will give the value expiration. In case records of quantity consumed are not kept, the same information can be (and often is) obtained by the inventory process. The quantity on hand is measured physically, multiplied by the price per unit to find the value on hand, and then the value expiration is found by deducting the value on hand from the net charge for item purchased. The important point to be made is that a market price can be applied to single units and that a unit of this type is either completely consumed or not used at all.

The value expiration of current intangibles such as the services of advertising, insurance, etc., and outside claims such as notes and accounts receivable, may likewise be measured with ease although the physical units are not available. Such assets remain in the possession of the business for such short periods that inventory figures (and consequently the expense figures) can be readily stated. The market again is available for testing the accuracy of the data used in the computation.

Moreover current assets are for the most part consumed in the accounting period during which the purchases are made. The retail merchant attempts to "turn" his stock several times during the year and hence keeps as small a stock on hand at any one time as possible. The manufacturer often maintains a stock of raw materials on hand just sufficient to keep the plant running from week to week, and at the close of any accounting period there remains on hand so small a proportion of the total purchases of such items that the amount involved in the inventory is relatively small.

Contrast this situation with the fixed assets. In the first place a fixed asset remains intact, as a unit, over many accounting periods. Such a tangible asset as a building, for example, which costs \$10,000 may last for twenty years, the complete building, as a unit, remaining in existence and performing its service throughout the whole period. The amount of \$10,000 is an expense of a twenty-year period but the proportion of this expense for each year, or other accounting period, is desired. Physical measurement, obviously, cannot be relied upon to furnish a

basis for value expiration. The building is essentially the same in size, shape, number of rooms, etc., on the day of abandonment as on the day of acquisition. Its condition, however, has deteriorated; the foundation has decayed, the roof needs replacing, the walls are weakened, but it is complete until the day it is retired from service. The value gradually expires throughout the twenty years, however, and it is the purpose of the depreciation accounts to record the value change currently. Depreciation may be defined as the value expiration of fixed property items.

As physical measurement cannot be used for determining the depreciation charge in the case of long-lived property items, other types of computation must be relied upon. In the case of long-term securities the accountant has recourse to amortization and annuity schedules, interest tables and formulæ, and market quotations. This form of investment, however, presents such specialized problems that a separate chapter has been devoted to the valuation of these assets. Further the downward trend of value changes in securities is not usually spoken of as depreciation although it is of this general character. Fixed tangible and certain intangible assets, however, present a different case.

The depreciation problem as discussed in this text is for convenience divided into two main parts. The present chapter is devoted to a presentation of the different methods for recording depreciation; and a discussion of the methods of measuring depreciation is deferred to the next chapter.

One further problem of depreciation which is of considerable practical importance is concerned with the amount which should be deducted from the inventory of the fixed assets of a public utility in order to cover depreciation. The courts have held that the proper base for determining a reasonable rate is the original cost, or the cost of reproduction minus accrued depreciation, but the advisability of this policy is often questioned by accountants and engineers. It is said that the method of accounting for depreciation should be considered before determining whether or not any deduction should be made for depreciation and if so the amount to be so deducted. This is much more than an accounting question, however, and it will not be taken up in detail. It is simply mentioned here to emphasize

the importance of the accounting phases of the problem. Some light will be shed on the question as the discussion proceeds through both of the chapters.

#### REPAIRS AND RENEWALS

Numerous expenditures for repairs must be made on the ordinary fixed physical property item in order to keep the property in condition for service. The total cost of the property may therefore be considered to be the original purchase price, or construction cost, plus all expenditures for repairs. The total depreciation of the item is the difference between the total cost and the salvage value at the end of its service life. It is customary, however, to treat this maintenance cost in two parts; namely, repairs and renewals. A *repair* is a replacement of a part of a unit, a *renewal* is a replacement of the whole unit. This is a rather arbitrary distinction but is convenient for use in the accounting records. The *unit* is the completed property item as represented in the purchase price or construction records at the date of acquisition. Thus the unit of equipment of a railroad is the locomotive, the car, the vessel, etc., though a unit as used in the accounts may differ from the unit of the operating official, who looks upon the locomotive, for example, as made up of a number of structural parts such as boiler, drivers, wheels, etc., any one of which could be considered as a unit for certain purposes. Whenever a replacement of a worn-out part is made it is considered as a repair, and in the technical sense only the replacement of the whole accounting unit constitutes a renewal.

A repair is made for the purpose of making good a decrease in the efficiency of a unit through use. If the unit taken for accounting purposes in each case were sufficiently large, all expenditures to replace property items would be repairs. Usually the unit as accepted is restricted to an asset of such size that this condition could not obtain. It is usually assumed that a repair makes good depreciation which occurs in the accounting period during which the repair is made, but in the ordinary case the repair charge cannot take care of all of the depreciation for it is evident that at some date the entire unit must be renewed. As one author very aptly puts the case, "All machinery is on an



irresistible march to the junk heap, and its progress, while it may be delayed, cannot be prevented by repairs.”<sup>1</sup>

A property unit may become worn out or decayed to such an extent that the cost of repairing the unit would be so great that it would be more practical to abandon the item and purchase an entirely new unit. Indeed one of the functions of the manager is to estimate carefully or compute the comparative expenses incident to the two choices of action. Shall the machine be repaired and operated for another year or shall it be abandoned and a new one purchased? The time must arrive when the latter procedure is the more economical. Further, an item of property which is still in good physical condition for performing the service for which it was purchased, may become worthless through *inadequacy* or *obsolescence*. Thus a railroad bridge may be rendered inadequate for use with an increased traffic or because a change in the type of commodities carried necessitates heavier locomotives; or a newly invented piece of machinery may replace an older type which is still in good condition but is not capable of producing the service as efficiently as the improved type.

The depreciation made good by repairs — as stated above — is usually treated as distinct from that made good by renewals. In fact the former is usually spoken of as *maintenance* to distinguish the character of the charge from depreciation. This terminology may seem somewhat illogical, based as it ultimately is on the arbitrary definition of the unit, but it has certain practical advantages. Obviously, it would be inadvisable, if not absolutely impossible, to treat each small expenditure as a renewal. To make an extreme illustration, there is considerable difference between the replacement of a bolt costing perhaps five cents on an auto truck and the replacement of the truck itself. There are surely certain practical reasons for accounting for the two expenditures on different bases. It must be admitted that the choice of the unit often results in calling certain replacements repairs which might better be called renewals, but the line of differentiation is a good one.

The entries for recording repair charges are very simple. The Repair Expense account is charged and Cash, or the prop-

<sup>1</sup> Hatfield, *Modern Accounting*.

erty account representing other assets used in making the repair, is credited. Thus if a piece of machinery is overhauled at a cost of \$500, the following entries are made,

Repair Expense . . . . .	\$500	
Cash . . . . .		\$500

A classification of repair expense accounts is desirable to show the cost of repairing different kinds of property items. A different repair account for each class of property used is desirable. In a large enterprise a complete organization is maintained for doing repair work. The repair expenses in such cases can be used for measuring in some degree the efficiency of the maintenance department. The repair accounts again may be further subdivided to show the cost of the different elements entering into the repair work such as labor, materials, power, etc. A classification of maintenance accounts for administrative purposes is often desired and may be incorporated in a detailed income sheet. The point to be emphasized is that the cost of the repair is charged to the expense accounts of the period in which the repair is made.

The renewal of a property item occurs when the old item is taken from service. The item may be replaced with like property or with an entirely different type. A renewal does not necessarily involve a replacement of a new unit for an old; the fact that an old item is retired and proper accounting made is sufficient to constitute a renewal. Every unit of property must be replaced by *some* property equal in value to the one retired if the capital investment is kept intact. That is, if a machine which cost \$5,000 is taken from service, property of the same value must be available to take its place. This may be a new machine similar to the old or an entirely new kind of property, but \$5,000 must be available in some form to renew or replace the machine taken from service.

The cost of the renewal is an expense, a charge against the revenue earned during the period the item is used. All of this expense may be charged against the revenue of the period in which the renewal is made, in which case the *replacement* policy is adopted; or it may be charged partly in each accounting

period throughout the service life of the property item, in which case the *formal depreciation account* policy is used.

#### THE REPLACEMENT POLICY

When the replacement policy is adopted, the cost of a property item less the salvage value is charged to expense at the end of its service life. This is the most convenient method to use in the accounts as it obviates the necessity for apportioning the depreciation over a series of accounting periods. The policy is properly applicable, however, only to those properties which consist of a large number of relatively short-lived property units which are consumed in approximately the same quantities during succeeding accounting periods. Railroad ties, telephone poles and the like are illustrations. The number of units runs into the thousands and because of the relatively short period of service, five to eight years for ties, for example, the renewals take place with a fair degree of regularity. It may be assumed without any great degree of error that the value expiration, as measured by the cost of units retired from service, corresponds to the value decline of all units in service during the same period. The fact that a class of asset items is made up of a large number of units, however, is not conclusive evidence that the replacement policy is the most desirable. The average number of retirements, the tendency of price changes, the growth of the property, and other conditions must be considered before placing an item in this class.

It may readily be seen that this treatment of the depreciation of fixed assets corresponds closely to the method of measuring value expirations of current assets. Each property unit is inventoried at cost continuously from date of acquisition to date of renewal, and expense is charged only when the item is completely consumed. The application of this policy has often led to incorrect analysis resulting in erroneous entries. A few illustrations will serve to make the point clear.

A machine which cost \$100 and has been carried in the Machinery account at that figure since the date of purchase is retired from service. The entries for recording the renewal, assuming no salvage value, are,

Renewal Expense . . . . .	\$100	
Machinery . . . . .		\$100

These entries should be made no matter what is done about replacing the worn-out item. The expense account must be charged in order to record the fact of property consumption of \$100. Machinery, of course, is credited because it is that form of property which has been consumed.

A separate Renewal Expense account should be kept for each class of property for which the replacement policy is used. Such an account represents the cost of abandoning property and this account, together with the repair accounts for the same class of property, represents the total cost of maintenance.

The expense incident to the renewal is measured by the cost of the item retired minus any salvage value; yet this point is not always recognized in the accounts. The classifications of certain public utility commissions define renewal expense as the "cost of replacing in kind" the property item retired minus any salvage value. This rule which is also often followed by industrial concerns leads to certain illogical results in a period of changing prices which can best be explained by illustration. Suppose, for example, that the machine which was retired (referring to the preceding illustration) was replaced by a new machine. The new machine might cost the same amount as the old, or more, or less. The entries in each case are of importance. First then, if the new one cost the same as the old, the entries would be,

Machinery . . . . .	\$100	
Cash . . . . .		\$100

This replaces the \$100 in the Machinery account and leaves the valuation of machinery the same as before the renewal was made. For convenience in recording the entries and to save duplicate postings, the two entries are often combined, the debit to Machinery in the second offsetting the credit to Machinery in the first, thus,

Renewal Expense . . . . .	\$100	
Cash . . . . .		\$100

No criticism can be made of this latter entry provided that it is realized that the expense item refers to the dissipation of the *old* machine and not the *new* one.

In the case at hand the rule mentioned above that the renewal expense should be the cost of replacing in kind would lead to the same result, but if the new machine costs \$110 instead of \$100 there is an important difference. If the first entries had been made charging Renewal Expense with \$100 and crediting Machinery with \$100 the entries for the purchase would be,

Machinery . . . . .	\$110	
Cash . . . . .		\$110

As a result of the two entries the valuation of machinery is increased by \$10, and this is as it should be as the value of the new machine is \$110 and it should be stated at this figure in the accounts. Now if the two entries were combined as before the result would be,

Renewal Expense . . . . .	\$100	
Machinery . . . . .	10	
Cash . . . . .		\$110

These entries recognize what has been said before, that the expense is equal to the cost of the old machine, and the increase in price is added to the machinery valuation. Considerable stress is laid on this point because if the rule mentioned above were applied in this case the following entries would be made,

Renewal Expense . . . . .	\$110	
Cash . . . . .		\$110

It may be said that the cost of replacing the old machine in kind is the cost of the new machine, and that therefore the whole cost should be charged to Renewal Expense; but this obviously leads to an overstated expense account and an understated property account.

Two things are doubtless being confused when this rule is applied to such a case, the *physical* property, and the *value* of the property. It is true that the manager has the same amount of physical property to work with after the renewal as before, but it does not follow from this that the value of the property

which he is using is the same as before. The investment in property of the character involved has increased. It has been emphasized at various points in this text that changes in the level of prices should be reflected in the accounts. This is a case in point. The renewal or depreciation cost of the product produced with the aid of the old machine is \$100, but this cost for the product from the new one will be \$110. If the entry just shown were made, this would have the effect of charging \$110 to the product of the old machine and further of understating a property account. This also creates a secret reserve. If the accounts were to be used by the manager in directing his course of production these entries would lead to erroneous conclusions. Likewise security holders would be misled as to the value of their holdings by the extensive use of this method in a period of rising prices.

To alter the case once more, suppose that the new machine costs \$90. In this case again the charge to Renewal Expense is \$100 but the valuation of machinery has decreased by \$10. The entries should be,

Renewal Expense . . . . .	\$100	
Cash . . . . .		\$90
Machinery . . . . .		10

This shows the proper form of entry in the case of falling prices. If the rule of charging Renewal Expense for the cost of replacing in kind were followed here the entries would be,

Renewal Expense . . . . .	\$90	
Cash . . . . .		\$90

This would result in an understatement of expenses for the preceding period and an over-valuation of assets on the balance sheet. This procedure is no more to be commended than in the former case. The renewal expense if the replacement policy is used is the cost of the retired item less any salvage value.

#### FORMAL DEPRECIATION ACCOUNTS

When formal depreciation accounts are used, an attempt is made to determine the value expiration of a property unit in

each accounting period and to charge that amount to expense. The remaining book value of each unit, therefore, represents the depreciated value. The various accounting entries possible under this policy will be discussed in the remainder of this chapter; and the next chapter will be devoted to considering the methods of estimating the amount of depreciation.

In order to make the discussion concrete it will be convenient to start with a hypothetical situation and alter the conditions for successive steps in the exposition. It will be assumed that the following illustration represents the original balance sheet of an enterprise just organized and ready for business. In order to make the illustration as simple as possible, the balance sheet captions of fixed and current assets are used to designate all of the various types of property items in each group. The ledger of the concern would contain accounts with building, machinery, equipment, etc., under the fixed assets; and cash, materials, supplies, etc., under current assets. For purposes of illustration these may be grouped under the two headings shown.

Fixed Assets . . . .	\$100,000	Capital Stock . . . .	\$150,000
Current Assets . . . .	50,000		
	<u>\$150,000</u>		<u>\$150,000</u>

After operating for one year, during which time all expenses except depreciation have been recorded, the statement appears as follows,

Fixed Assets . . . .	\$100,000	Capital Stock . . . .	\$150,000
Current Assets . . . .	75,000	Current Liabilities . . . .	5,000
		Revenue (net except for depreciation) . . . .	20,000
	<u>\$175,000</u>		<u>\$175,000</u>

The revenue item shown on the equity side is the net result of deducting all expenses from gross revenue except the depreciation of the fixed assets. But the decrease of the fixed assets is also an expense, hence the figure stated is not *net* revenue. If the property has depreciated \$10,000, the following entries would record that fact,

Depreciation Expense . . . . .	\$10,000	
Fixed Assets (building, machine, etc.) . . . . .		\$10,000

The Depreciation Expense account is now closed against the revenue figure and the balance sheet would show,

Fixed Assets . . . . .	\$90,000	Capital Stock . . . . .	\$150,000
Current Assets . . . . .	75,000	Current Liabilities . . . . .	5,000
		Net Revenue . . . . .	10,000
	<u>\$165,000</u>		<u>\$165,000</u>

The \$10,000 item shown in Net Revenue account may be distributed in dividends or otherwise disposed of in the interests of the stockholders. If other classes of securities were outstanding, it is from this figure that the contractual distribution of interest must be met. No distributions could properly have been made until the last journal entry was recorded because, as was stated before, *net* revenue was not stated until depreciation was charged.

The current asset item will bear considerable analysis. The corporation started operations with an investment of \$50,000 in current assets as shown by the first balance sheet, and now there is \$75,000 in the same type of property. How did the increase come about? The various current asset items were constantly shifted from one form to another, from raw materials and supplies to finished product and back to cash or accounts receivable from the sale of the product. These were used again for new supplies, labor service, etc., and after producing a finished product, resulted in the acquisition of new assets — cash and accounts receivable. The \$75,000 item may not contain any of the original \$50,000 of assets. The value of the assets as here represented, however, may well be considered to be a part of the original investment; that is, the original \$50,000 invested in current assets is still in the current assets for it has been maintained through the sale of product at least equal in price to the cost of current assets used in production. Then current assets to the amount of \$5,000 have been added through the purchase of materials or supplies on open account which are not yet paid for. This is shown in the fact that the current liabilities were increased by \$5,000. Further, another \$10,000



is accounted for in the fact that a net revenue of that amount has been earned. This of course would be in the form of current assets brought in through sales. Finally the remaining \$10,000 increase may be accounted for in the fact that the amount of fixed assets which were consumed, and included in the selling price of product, brought in \$10,000 in current assets. This accounts for the whole increase.

It is the last amount that is of particular significance in this connection. It might be said that a part of the value of the fixed assets (\$10,000) has been transferred to current assets; that is, that by charging expense with the depreciation of fixed assets accruing within the period, an equal amount of current assets received through sales is retained in the business as current assets to offset the amount of fixed assets consumed. To make this point still more emphatic, it may be shown that the increases accounted for by the other causes may be disposed of to the present equities without impairing the capital, while the latter cannot. Suppose, for example, that among the current assets there is cash \$25,000. The current liabilities could be paid off with \$5,000 of this sum and a dividend of \$10,000 (equal to the net revenue figure) could be paid out of the balance. After these transactions are consummated, the balance sheet would show,

Fixed Assets . . . .	\$90,000	Capital Stock . . . .	\$150,000
Current Assets . . . .	60,000		
	<u>\$150,000</u>		<u>\$150,000</u>

There is an additional \$10,000 in the current assets over the amount originally invested and this cannot be distributed in dividends without impairing the capital. Any disbursement which does not bring in assets of an equal value at this point would cause a deficit to appear.

In this illustration, the credit for depreciation was made directly to the asset accounts. It is assumed that the remaining balance in such an account represents the actual present value of the property. It is often considered desirable to leave the cost figures of all permanent property items in the accounts until a unit is actually retired from service and to make the credits

to a valuation account, *Allowance for Depreciation*, instead. The entries recognizing depreciation in this case would be,

Depreciation Expense . . . . .	\$10,000	
Allowance for Depreciation . . .		\$10,000

As a result of this entry the fixed assets would remain the same and the balance sheet after all other transactions as before would be as follows,

Fixed Assets . . . . .	\$100,000	Capital Stock . . . . .	\$150,000
Current Assets . . . . .	60,000	Allowance for Depreciation . . .	10,000
	<u>\$160,000</u>		<u>\$160,000</u>

This represents exactly the same condition as the preceding balance sheet. The use of the account *Allowance for Depreciation* need cause no difficulty as it is the same as placing temporarily in another account the credit side of the fixed assets accounts.

Each time that a unit of the fixed assets is retired from service, the cost of the item minus any salvage is charged to the *Allowance for Depreciation* account and credited to the proper fixed asset account. At the end of each accounting period, the accrued depreciation is charged to expense and credited to *Allowance for Depreciation*. This account should therefore always represent the difference between the cost of the property items actually in service and the present value of those items. The fixed asset accounts always show the original cost of the assets actually in use. In the ordinary situation, the *Allowance for Depreciation* account will always show a credit balance; that is, the present value of all fixed assets taken together is always less than the cost of all those assets. This fact scarcely needs demonstration, for in a composite property in no case would all of the assets be renewed at one time. Some items last five years, others fifty or more; in some years a large and costly item will be renewed, causing a large debit to the valuation account; in other years, renewals are light causing small debits to this account. The balance therefore fluctuates from year to year; sometimes it will be a large item, sometimes small, but never reaching zero.

The amount of the depreciation charge being in the last

analysis an estimate, errors are likely to be made. The charges might be too large or too small. This fact may be discovered at any time but usually not until the date of retiring an item. The amount of depreciation which has been charged for the value decrease in the unit may exceed the actual amount necessary or it may not be large enough. Such a situation is bound to arise and as soon as such conditions are discovered corrective entries should be made. If the previous charges have been too small, Depreciation Expense (or Surplus if the item is large) should be charged and Allowance for Depreciation credited for the amount of the error. If the converse situation obtains, the correction can be made by debiting Allowance for Depreciation and crediting either Net Revenue or Surplus. In case a machine or other property item is suddenly rendered useless because of some unforeseen contingency, the correction might well be temporarily made by debiting a deferred debit account as explained in Chapter X instead of expense. As a general rule corrections are not often necessary and when required are not of much significance. The regular periodical charges take care of depreciation in a fairly adequate manner.

In the balance sheet just under discussion there is an additional \$10,000 in the current assets due to the fact that the value decline in fixed assets has been charged against current revenue. What should be done with these additional assets? Three different policies are open, each being advisable under certain conditions: (1) the assets might be placed in a special fund awaiting the replacement of the fixed assets for which the depreciation charge was made; (2) they might be given back to the stockholders as a return of capital; and (3) the funds might be kept active in the enterprise and invested in either additional fixed assets or current assets or partly in each. As each of these cases requires considerable analysis a special section will be devoted to each.

#### THE DEPRECIATION FUND

The additional current assets representing the conversion of fixed assets may be placed in a special fund which will always be available for making renewals. Business men and even some

accountants often confuse the depreciation charge as described in the last section with this setting up of a special fund. The statement is frequently made that the depreciation charge results in reserving a fund to replace the property when it is worn out. This does not necessarily follow as has already been shown for the establishment of such a fund is purely optional with the company. Other policies are open and are frequently advisable. If a special fund is set up, however, the following entries equal in amount to the Depreciation Expense charge are made,

Depreciation Fund . . . . .	\$10,000	
Cash . . . . .		\$10,000

At the time this entry is made, \$10,000 is actually placed in a special cash fund. It may be turned over to a trustee, placed in a special bank account drawing interest, or may be invested in securities which may be easily disposed of when funds are needed for renewals. In any case these funds are not available for general business purposes.

After this entry is made, the balance sheet (see the illustration on page 495) would appear as follows,

Fixed Assets . . . . .	\$100,000	Capital Stock . . . . .	\$150,000
Depreciation Fund . . . . .	10,000	Allowance for Depreciation . . . . .	10,000
Current Assets . . . . .	50,000		
	<u>\$160,000</u>		<u>\$160,000</u>

This shows the same condition of the enterprise as the preceding statement except that a part of the current assets has been labeled "Depreciation Fund." The amount in the Depreciation Fund account is just equal to the amount in the Allowance for Depreciation account on the other side of the balance sheet; but neither one is essential to the other. Allowance for Depreciation would not appear on the balance sheet at all if originally the credit had been made to the asset account instead of to the valuation account. In such a case the fixed assets would stand at \$90,000, but the Depreciation Fund would still show \$10,000. Likewise it is possible to have the Allowance for Depreciation account shown on the equity side and no fund account on the asset side. This case will be shown more fully in the next section. The point to

be emphasized here is that there is no fundamental relation between the two accounts. The Allowance for Depreciation results from crediting this valuation account instead of a property account when a charge to expense is made for depreciation. The Depreciation Fund results from taking a certain amount of cash out of the general cash account and placing it in a special fund. The two accounts are equal in amount because the sum set aside is supposed to accumulate to the investment cost of the property item at the time it is renewed, and the same amount measures the value decline. In some cases it might be convenient to accumulate the fund on another basis than the depreciation charge. In this case the two accounts would not be equal. Normally, however, if a fund is maintained it will be equal in amount to the valuation account balance.

The entries at the date of a renewal when the fund is maintained are of interest. Suppose, for example, that a machine listed in the Machinery account among the fixed assets at \$5,000 wears out and requires replacement. The old machine is sold for scrap bringing in \$50. The new machine required to replace the old one costs \$6,000. In the first place, the entries recording the salvage from the old unit are,

Cash . . . . .	\$50
Machinery . . . . .	\$50

This leaves \$4,950 in the Machinery account which must be written off against Allowance for Depreciation. If the estimate of depreciation has been correct, there will have been just \$4,950 charged to Depreciation Expense and credited to Allowance for Depreciation during the service life of the machine. Assuming this to be the case the entries are,

Allowance for Depreciation . . . . .	\$4,950
Machinery . . . . .	\$4,950

The old machine has now been entirely eliminated from the book accounts. Further, it may be assumed that \$4,950 has been placed in the depreciation fund on account of this machine. This amount should now be available for use in buying the new machine. First that sum will be transferred to the general cash account and for this transaction the entries are,

Cash . . . . .	\$4,950	
Depreciation Fund . . . . .		\$4,950

Now the new machine is purchased which, as has been said, costs \$6,000. For this purchase the entries are,

Machinery . . . . .	\$6,000	
Cash . . . . .		\$6,000

It may be seen that \$4,950 of this cash came from the accumulated depreciation fund and \$50 from the sale of the scrap. The additional \$1,000 called for in the price must be obtained from other sources. Unless the firm has on hand more cash than is needed for current operations, this sum must be obtained through new investment. Additional stock may be issued, or funds may be secured through some form of borrowing such as bonds or notes. In any case, an additional investment of \$1,000 is made in machinery.

It may be well to inquire as to the advisability of creating a special depreciation fund. Should a firm label a certain part of its cash receipts from the sale of product as a fund which can be used only for replacing specific units of fixed assets used in producing the revenue? In general a negative answer might be given to the question. It would be better financial policy to use such funds in ordinary business operations. Cash tied up in a special fund such as this cannot be of as much service to a firm as it would be if invested in additional equipment or used as additional working capital, in case these things are needed. But if such increases in equipment are not needed, a fund may be advisable. One case in which this situation might obtain would be in a terminable enterprise such as a mining or timber business. If the fixed capital is invested in a mineral deposit in a specified place and there is no intention of extending the business to new fields, such funds would not be of service for additional equipment and might be kept in a fund until the termination of the enterprise. At this time the assets in the fund should have accumulated to a sufficient size to enable the corporation to pay off all securities.

Again if a continuous enterprise has reached a relatively static stage in development, particularly with regard to its fixed plant,

a fund might be advisable. A water supply plant, for example, may reach a stage where no additional pumps or mains are necessary for a considerable period of time. The funds reserved by the depreciation charge cannot be put to a particularly profitable use in the extension and may be kept in a fund at least until new extensions are planned.

#### DEPRECIATION FUND RETURNED TO INVESTORS

In either of the cases just mentioned a special fund would be justified. The total investment would remain unchanged but the form of assets held would be gradually changing from fixed physical property to cash funds. An alternative plan in either case would be to turn the funds thus freed from the fixed investment back to the security holders.

The argument for returning the assets under consideration to the investors runs something like this. The original investment was made to enable the enterprise to secure all of the necessary permanent equipment and working capital to conduct the specific business for which the organization was effected. A part of the investment is converted into cash in the ordinary operations of the business. Since this is not needed in the enterprise, to place this cash in a special fund is to compel the stockholders to change the form of investment from a mining business, for example, which is highly speculative, to a conservative investment. In other words, the corporation is reinvesting its stockholders' funds on a new basis.

As applied to the terminable enterprise this argument has considerable force; in fact it has the sanction of some few court decisions. It may be seen that the investment of the stockholder gradually changes, when the depreciation fund is maintained, from the assets of a mining concern to assets in the form of a savings account in a bank or in securities which usually bear a very low rate of interest. The stockholders may prefer, and with some reason, to have this fund as it accumulates paid over to themselves to invest as they see fit.

In case such a procedure is followed, however, care must be exercised to inform the stockholders as to what constitutes a return of original investment and what is dividends on the

investment. Two different methods may be used to effect this result, (1) actually buying back some stock with the cash, or (2) paying the cash to all stockholders *pro rata* as a return of capital. The accounting entries in both cases are of importance.

Referring to the balance sheet on page 495 again for an illustration, suppose that it is decided to pay the additional funds to stockholders by buying back \$10,000 of the stock at par. The entries covering this transaction would be,

Capital Stock . . . . .	\$10,000	
Cash . . . . .		\$10,000

and after these entries are made, the balance sheet would show,

Fixed Assets . . . . .	\$100,000	Capital Stock . . . . .	\$140,000
Current Assets . . . . .	50,000	Allowance for Depreciation	10,000
	<u>\$150,000</u>		<u>\$150,000</u>

This same procedure would be followed each year until the end of the life of the enterprise by which time all of the stock would have been bought back and the affairs of the corporation closed.

Legal restrictions would prevent this practice in some states where corporations are not allowed to purchase their own stock. Further it would be practically impossible to buy the stock back at par unless some provision were made in the articles of incorporation; and if it were necessary to pay a high premium for the repurchased stock, it would be impossible to return the investment on this basis. In addition to these objections there is a more fundamental reason why this method of returning the investment would usually be inadvisable. It would be necessary to select the stock of certain stockholders for cancellation each year and these individuals would be obliged to forego their opportunities for high profits in future years in this enterprise and to seek new fields for investment long before they had planned to do so, while the chances for gain would remain in the hands of the favored few whose stock had not been called. Further, if there were any bonds outstanding, the margin of safety for the bondholders would continually decrease. Securities of a concern which planned to retire stock in this manner could not be issued to advantage.



The more reasonable procedure then is to pay the funds over to the stockholders *pro rata*. In case this is done, however, the stockholders should be apprised of the fact that the checks they are receiving are for a return of investment and not a dividend. All too often in the past mining concerns in making such payments to stockholders have included the amount in the dividend check, thus leading the stockholder to treat it as income in his private budget. This has resulted from the practice of ignoring depreciation altogether, which, of course, cannot be commended.

If the fund is distributed on a *pro rata* basis the entries recording that fact would be,

Capital Returned . . . . .	\$10,000	
Cash . . . . .		\$10,000

and the resulting balance sheet would be,

Fixed Assets . . . . .	\$100,000	Capital Stock . . . . .	\$150,000
Capital Returned . . . . .	10,000	Allowance for Depreciation . . . . .	10,000
Current Assets . . . . .	50,000		
	<u>\$160,000</u>		<u>\$160,000</u>

Capital Returned is a valuation account, an offset to the proprietary account Capital Stock. This account would increase each year until at the expiration of the mine it would be equal in amount to the fixed assets item, which means that all of the investment in the form of property has been returned. Current assets remaining would be sufficient to pay off the balance of the claims of the stockholders.

While the policy of returning capital may be advisable in some forms of terminable enterprises, it can seldom be commended for continuous concerns. To return capital to the stockholders of such a business would mean that at a later date—when a renewal must be made—the stockholders must be assessed an amount equal to the amounts previously returned. This not only would be inconvenient but would certainly lead to misunderstandings and probably to the failure to obtain the funds needed. Further it would cause the investment market to be very unsettled and increase the risk of stock purchases. For the continuous enter-

prise the cash should be retained in a special fund as explained in the preceding section or else used for additional assets in the business as will be further explained in the following section.

#### THE POLICY OF REINVESTING THE FUND IN THE BUSINESS

Normally the continuous enterprise is a growing concern. New capital is continually needed for additions to the plant, new equipment, additional working capital, etc. Permanent increases can ultimately be made only through the reinvestment of net earnings or through new investments by security holders. But temporarily the amount reserved by the depreciation charge can well be applied to such additions. In fact it is considered a good form of financing to use the depreciation funds for additions, even though new capital must be raised for replacing the worn out units at the time of abandonment. It is moreover perfectly proper as the situation is the same as though the depreciation funds had been kept for the renewals and new capital raised for additions. The corporation in the meantime would have been relieved of the necessity of issuing new securities for some considerable period and probably would have made some net saving in interest accruals.

If this policy were adopted by the company whose balance sheet is shown on page 495, and \$10,000 were invested in new machinery, the entries would be, as for any purchase of a like character,

Machinery . . . . .	\$10,000	
Cash . . . . .		\$10,000

and the balance sheet after the purchase would show the following facts,

Fixed Assets . . . . .	\$110,000	Capital Stock . . . . .	\$150,000
Current Assets . . . . .	50,000	Allowance for Depreciation . . . . .	10,000
	<u>\$160,000</u>		<u>\$160,000</u>

The net valuation of the fixed assets is \$100,000, the same as it was at the start. But the property situation is somewhat different than before. The original assets, costing \$100,000,

are still in use although depreciated by \$10,000. The \$10,000 obtained from revenues which covers this decrease in value of the original assets has been used for purchasing additional equipment. The depreciated value of the old assets plus the cost of the new machinery equals the original investment. The investment is kept intact by this method. The book value of assets (fixed assets minus the Allowance for Depreciation balance) will always be equal to the total amount invested.

At the time an item is renewed the entries are simple. Suppose for example that a machine which cost \$2,500 is sold for junk at the end of five years for \$25. The only entries necessary as far as depreciation accounts are concerned are,

Cash . . . . .	\$ 25	
Allowance for Depreciation . . . . .	2,475	
Machinery . . . . .		\$2,500

This takes the value of the machine off the books entirely. There may or may not be funds immediately available to replace the abandoned machine. If cash is available the purchase can be made from such funds, but if the cash balance is not large enough to stand the purchase, additional funds must be obtained from stockholders or through borrowing.

It might appear on the face as though this were borrowing to replace worn-out property. One looking at the matter superficially might say that this company was borrowing money to pay for a worn-out machine; but such a criticism is evidently unjust. The loan is not obtained for paying for the old machine, for this has been entirely paid for out of revenues during the life of the machine and the amounts thus received invested in additional equipment. The amount borrowed may properly be considered as *new investment* in the business, the assets for which are already on hand. The assets of the concern are properly maintained.

It may be that additional fixed assets are not needed in amounts equal to the accrual of depreciation but that additional working capital — current assets — are needed. Increasing the inventory of materials, supplies, etc., has the same effect as purchasing new items of permanent property. Some funds might be used for fixed assets and some for current, but the result is the same. In fact if all the funds are not needed for additions to either fixed

and current assets a part might be placed in a special fund until actually needed. This would be in effect a combination with the depreciation fund policy. Suppose, for example, that the \$10,000 reserved by the depreciation charge in the illustrations used throughout the chapter could be used, \$5,000 for additional equipment and \$2,000 for additional materials, and that the other \$3,000 was not immediately desired. This might be placed in a depreciation fund and the balance sheet would show,

Fixed Assets . . . .	\$105,000	Capital Stock . . . .	\$150,000
Depreciation Fund . .	3,000	Allowance for Depreciation	10,000
Current Assets . . . .	52,000		
	<u>\$160,000</u>		<u>\$160,000</u>

The fund might be kept in this way as a sort of reservoir for cash not needed in business operations immediately but which must be kept in some form in the possession of the company to make good the depreciation of fixed assets. As soon as additional cash is needed, this fund can be "tapped" and used for the purpose.

The last illustration should make much clearer the point made in the earlier part of the chapter, that there is no necessary relationship between the Depreciation Fund account and the Allowance for Depreciation on the balance sheet. Either one might appear without the other, both might appear equal in amount, or both might appear with unequal amounts as shown in this balance sheet.

As a final consideration the point must once more be emphasized that depreciation is accounted for satisfactorily when Depreciation Expense is charged and either the specific property account or the Allowance for Depreciation account credited, and that until this entry is made depreciation is not properly accounted for. The question as to whether a fund shall be maintained, or whether capital shall be returned to investors, or whether the funds shall be reinvested in the property, is primarily one of financial policy.

## XXIII

### METHODS OF MEASURING DEPRECIATION

THE determination of the amount of depreciation to be entered in the formal depreciation accounts in case this policy is adopted is a matter of considerable importance. It was shown in the last chapter that physical measurement together with market quotations cannot be used for fixed assets in the same manner as for current assets. Some method which spreads the total depreciation over the service life on a reasonable basis must be used. The question as to what is a reasonable basis in the ordinary situations and the methods which meet these conditions furnish the subject matter for this chapter.

#### THE BASIS FOR MEASUREMENT

The most satisfactory basis for measuring the depreciation of a property item if it could be used would be actual inspection. If the appraiser could look at the property and make a reasonable estimate of its present value condition at each inventory date, this would give a sound basis for depreciation charges. But such precision is impossible in the vast majority of cases. The most that can be done by inspection is to estimate the service life of the item and this fact may be made the basis of an apportionment of the depreciation charges to the various expense statements during that term. Physical condition and accrued depreciation are continually being confused and for this reason the distinction between the two terms will be explained in some detail.

This confusion of terms often leads to the following error in practice. The physical condition of a property item is expressed in a percentage figure; that is, the appraiser either by physical measurement or other means of inspection finds that the property item is less efficient than when new and expresses the pres-

ent condition as a certain per cent of new. This percentage figure is then multiplied by the original cost (or cost of reproduction new) to find the present *value* of the asset, and an illegitimate transition is made by mathematical computation from physical efficiency to value.

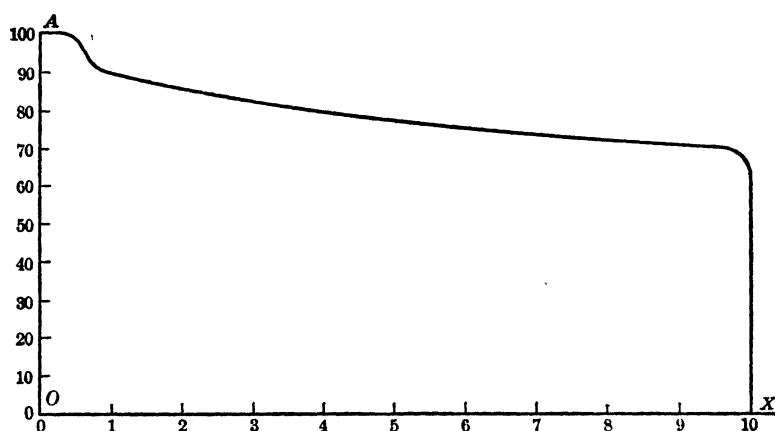
The following, an actual case, illustrates this point. A law on the statute books of a certain state requires that every stationary boiler must be absolutely scrapped at the end of twenty years from date of installation no matter how high its production efficiency on that date. A corporation in this state had a boiler which cost \$10,000 and was still in service in 1916 and valued on the books at \$8,000 although on that date it had served for eighteen years. The manager said that it was still giving service at eighty per cent and therefore should be valued at eighty per cent of cost. This confusion of physical and value facts is quite common. Obviously a boiler which has only two years of life remaining is not worth four-fifths as much as another boiler, of the same cost, which has twenty years of life. What manager would be willing to pay \$8,000 for this boiler in place and performing service if a new one could be obtained at a cost of \$10,000 which would perform the same service for twenty years? In general, moreover, the relatively high percentage of efficiency of machinery up to the very date of displacement should make it clear that terms of relative efficiency cannot be directly transposed into terms of value.

That this fact is not clearly understood was demonstrated again in the valuation of a certain telephone company's plant in the spring of 1918. The valuation engineer testified in court that the telephone poles were worth fifty per cent of their cost new. In defense of his statement he submitted statistics showing that on the average the poles had rotted at the ground to a depth of one-half the radius.<sup>1</sup> If the value decreases proportionately with the progress of the rot, then the poles would not be worthless until rotted to the whole depth of the radius. But it would be impossible to allow the deterioration to approach such a limit

<sup>1</sup> In this case the mathematical error was as gross as the accounting error. If the poles had rotted to a depth of one half the radius, the deterioration amounted to seventy-five per cent instead of fifty per cent.

as even a slight wind would settle the matter long before the rot reached the center of the pole. The measurement referred to was improperly used.

The productive efficiency, as implied above, cannot in the normal case be allowed to fall below a fairly high percentage of the condition when new. Fifty per cent in many cases is the lower limit and eighty or more is common. As soon as it is impossible to attain results set by these limits, the item is renewed. The following chart illustrates the point:



The rates of per cent efficiency are shown on the perpendicular axis OA scaled from 100 down to 0. The years of service life are shown on the horizontal axis OX from 1 to 10. It is assumed that the asset item being considered cannot be operated at all below seventy per cent efficiency. The curve shows the decrease in efficiency from date of purchase to abandonment. During the first year the efficiency drops below ninety, then from the first to the ninth years there is a very slight decrease, while in the tenth year there is a rapid decline and the item is scrapped as worthless. This, it is said, is the normal situation for machinery as the efficiency falls quite rapidly the first year down almost to the normal. Then the fall is scarcely noticeable until the last year when it falls below the limit set for abandonment and it is discarded. If depreciation were measured on the basis of efficiency, the value curve would coincide with the one shown. The

charge for depreciation would be large the first year, then for most of the rest of the service life the charges would be small, and finally at date of abandonment a very large amount would be charged to depreciation. The purpose of depreciation accounts cannot be served in this way.

This does not mean that the engineer's figures for productive efficiency are of no service at all in this connection. On the contrary they are indispensable, in most cases, though a different use should be made of them than that shown above. The function of the appraiser is to determine the probable service life and this depends in some measure on the decrease in productive efficiency. At any one time, a judgment can be made as to how much life is left in the item on the basis of present condition. The probable date at which this will fall below the point at which it would be better to discard is the information desired. Given this information together with the cost figures, and probable salvage value, depreciation may be measured on some other basis.

Another basis for depreciation charges advocated by some accountants is the revenue figures. It is argued that a rather even flow of income is desired by security holders and that the amounts charged to expense for depreciation can be made light in years when gross revenues are small and heavy when gross revenues are large. This policy would tend to keep net revenues fairly stable. The amount to be charged might be found by taking a certain fixed rate of the gross revenue, a certain charge per unit of product, or just arbitrary sums which would be very small or nil some years and very large in others. This was the policy of railroads before the Interstate Commerce Commission's rulings compelled the roads to adopt a regular depreciation charge. In years when traffic was heavy and consequently revenues were high a great many renewals would be made, and then when the revenues were light equipment which was practically worthless would be retained in service awaiting a time when revenues would cover the charge. This policy is practiced in part under the present rules. The property units adopted for accounting purposes are so large that the repairs (replacements of parts of units) constitute a large part of total maintenance. These are charged to expense when incurred. By making repairs in prosperous years and failing



to make repairs in lean years, total maintenance can be made to vary with revenue. The argument always urged for this practice is that fluctuations in earnings result in an unsettled condition in the security market.

It must be admitted that fluctuation in the dividend rate produces an unfavorable effect on the securities of a corporation, and that it is desirable to keep the dividend rate fairly constant; but it does not follow from this reasoning that net revenue must be kept fairly stable through manipulating the expense accounts. Net revenue is supposed to represent the difference between gross revenues and expenses for a period, and since both gross revenue and expenses are subject to changes from period to period, the net revenue figure should also change. To use the depreciation accounts to hold net revenue constant is using it to misstate the facts, for net revenue does fluctuate and this fact should not be covered up. As much injustice can be done security holders by presenting income sheets with stable income as by paying dividends of varying rates from year to year. The stockholder minimizes the amount of risk involved if he sees the net revenue figure kept fairly stable, and therefore Net Revenue should represent the facts as nearly as they can be determined.

The fact that net revenue fluctuates does not mean that the dividend rate must also fluctuate for dividends can be kept constant through the use of the surplus accounts. In prosperous years a part of the net revenue may be carried to surplus to await the year of depression when the surplus can be tapped for dividends. In this way net revenue may be correctly stated and dividends kept stable.<sup>1</sup>

It may be that depreciation charges should be somewhat larger in years when the equipment is being used more fully than in others, but the basis of the charge should be actual depreciation and not the revenue figure as the influence of revenue on values is only general except in the case of intangibles. Costs are the significant facts for tangible assets as has been shown before, and the discounting process does not apply to physical items.

To repeat the conclusion drawn with respect to the two bases suggested, physical deterioration alone is not decisive nor is the

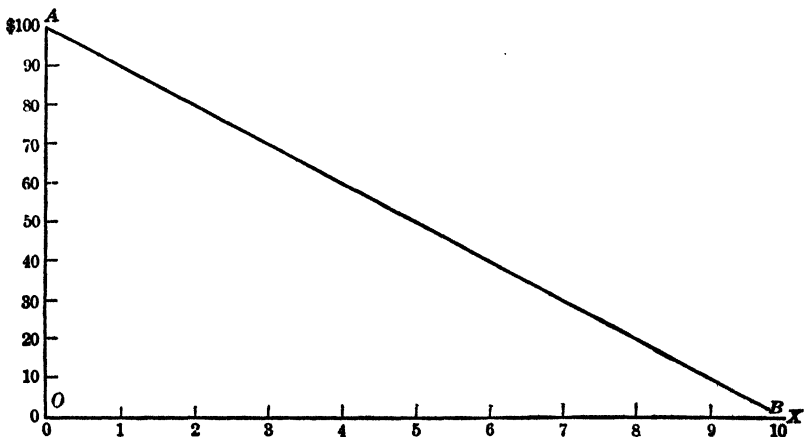
<sup>1</sup> See Chapter XIII.

gross revenue figure in measuring depreciation of physical assets. The former may be used by the engineer as a basis for estimating the service life, but when this figure is obtained the value decrease must be determined by some other schedule. It will be the purpose of the succeeding sections of this chapter to explain some of the methods used.

### STRAIGHT LINE METHOD

The assumption on which the *straight line* method is based is that a property item loses an equal amount of value during each year of its service life. An estimate of the probable service life is first made. This, as was stated in the preceding section, is based on an investigation of the physical factors. Further an estimate is made of the probable salvage value, the sale value of the scrap at date of abandonment. The difference between the original cost and salvage value is total depreciation and this amount divided by the service life (expressed in accounting periods) is the regular depreciation charge. Thus if a machine costs \$100, and it is estimated that the salvage value will be \$5 at the end of ten years, the total depreciation is \$95, and the annual charge is \$9.50.

The reason for calling this a straight line method is evident. The following chart illustrates the situation :



The line OA represents the value expressed in dollars, the line OX the life in years. The original value is \$100 and the salvage value at the end of the tenth year is \$5. The straight line AB drawn between the points A (\$100 value at beginning of first year) and B (\$5 value at end of tenth year) represents the value decline for the intervening period. An interesting comparison may be made between the chart on page 508 and this one. In the former the curve represents the decrease in efficiency and is typical of the normal physical asset. The line AB in this chart shows the decrease in value according to the straight line method. The two charts may be used for the two classes of facts for the same asset.

There are two reasons why this method is found in quite general use. First its simplicity commends it to the average accountant. The figures are easily obtained and the entries can be made with very little computation. Second, in all probability the straight line does at least approximate the value decline. The values at two different dates are all that can be tested on the market, one at date of purchase and the other at date of abandonment; the manager plans to use the item quite constantly throughout the intervening period; and it is therefore reasonable to expect that the cost of using the item during one period would be approximately the same as for any other.

This probably is the fact except for one factor which has not been taken into account. The complete utilization of the item takes time and hence interest must be considered. It was shown in an earlier connection that wherever a durable asset is used, implicit interest enters into the calculation at some point. (See Chapter XV.) The straight line method fails to recognize this fact. That interest does and should enter into the computations may be shown in different ways.

It was shown in the last chapter that when the depreciation charge is made a sum of assets is available which is equal to the charge but which cannot be used for dividends. This sum could be applied in one of three ways: (1) placed in a special fund; (2) returned to the investors; or (3) reinvested in additional plant. No matter which one of these things is done, the investment situation is changed. In the first case the amount retained is placed in a special fund but this special fund is placed where it

will produce some revenue — at least savings bank interest. The original assets then are producing revenue and the funds set aside for depreciation are also producing revenue before they are needed for replacement purposes. In the straight line method this additional revenue is not considered in the depreciation charge. The recognition of this interest is simply another way of recognizing the implicit interest in the valuation of the original asset. It takes time to obtain the revenues from the asset. A large part of the revenue the first year is net, a smaller part replacement of the investment. In each succeeding year, however, the net revenue (interest) element decreases and the return of investment increases.

Another way of bringing out the point very clearly is this. The fund which is set aside is to be used for replacing the asset at the time it is worn out. This being the purpose the interest earned on the fund should be added to the fund and not considered as outside revenue. The following table shows the results of using the straight line method to accumulate such a fund to replace the \$100 machine mentioned above when interest can be earned at the rate of five per cent.

YEAR	DEPRECIATION FUND FIRST OF YEAR	INTEREST ON FUND	DEPRECIATION CHARGE	DEPRECIATION FUND END OF YEAR
1	0.00	0.00	9.50	9.50
2	9.50	.48	9.50	19.48
3	19.48	.97	9.50	29.95
4	29.95	1.50	9.50	40.95
5	40.95	2.05	9.50	52.50
6	52.50	2.62	9.50	64.62
7	64.62	3.23	9.50	77.35
8	77.35	3.87	9.50	90.72
9	90.72	4.54	9.50	104.76
10	104.76	5.24	9.50	119.50

The fund actually accumulates to \$119.50 while the depreciation fund required is only \$95.00. The \$24.50 difference is interest earned on the fund. The fund accumulated to more than was called for because the sum annually placed in the fund was larger than necessary. But the annual increase in the

fund was obtained through the depreciation charge. Depreciation charges then have been improperly distributed as between years. Expenses have been stated too large at least in the early years and net revenue has accordingly been stated too low. This understatement of net revenue is finally corrected, of course, as shown by the fact that the fund is greater than needed at the renewal date, and the final result at the end of the ten-year period is the same as though interest had been recognized; but the periodical statements throughout the ten-year period contain this element of error.

The same situation obtains in case the fund is returned to the stockholders, for here the interest earning on the fund is paid directly to the stockholders. The net revenue from operation in the early years is understated but the amount of the understatement comes back in the form of interest received by the stockholder on the capital which has been returned to him. The interest calculation must be made even though the fund is not kept in the corporation's possession.

Finally if the fund is reinvested in additional assets for the company, the same conditions arise. The new investment will be made only in case revenue can be earned sufficient to cover interest. In this case the revenue from the fund is received by the company only not specifically as interest, as it is a part of the general revenue of the concern. In any case then it would seem that interest must be considered in the depreciation charge.

The chief methods advocated for taking care of the interest element are the sinking fund and the compound interest methods. These will be considered in the next two sections.

Before going on to this discussion, however, it might be well to make one further statement in defense of the straight line method from the practical standpoint. Depreciation in the last analysis is an estimate. The service life as stated in advance is the judgment of the manager or valuation engineer; in very few instances will the final results coincide with the original estimate; and corrections must be made as soon as an error in judgment has been discovered. In all probability therefore the errors in estimate will in large measure at least offset the errors from omitting the interest calculation. The importance of this consideration is minimized as statistics of service life become more

accurate through the use of experience tables and as equipment becomes more standardized. The more accurate the estimates of service life, the more important it is to take the interest element into account.

#### THE SINKING FUND METHOD

The annual charge for depreciation under the *sinking fund* method is an annuity which will accumulate at a given rate of interest to the cost less salvage value at the time a property item is abandoned. An amount equal to the annual charge is placed in a special fund each year, hence this method can be used only when the special fund is maintained. As an illustration of this method, the case of the machine illustrated under the straight line method may be used. That is, the machine costs \$100, will last ten years and have a salvage value of \$5. Further it may be assumed that the fund can be invested at five per cent convertible annually. The annuity which will accumulate to \$95 (cost less salvage value) in ten years may be found by the use of formula (25) in Chapter XVI. This amounts to \$7.55, and this sum is charged to Depreciation Expense each year and is credited to Allowance for Depreciation. The same sum is placed in a special fund to accumulate to the desired amount. The following table shows the situation from the first to the tenth years inclusive.

(1) YEAR	(2) FUND BEGIN- NING OF YEAR	(4) DEPRECIATION		(5) Total	(6) FUND END OF YEAR
		(3) Interest	Annuity pay- ment		
1	\$ 0.00	\$ 0.00	\$ 7.55	\$ 7.55	\$ 7.55
2	7.55	.38	7.55	7.93	15.48
3	15.48	.78	7.55	8.33	23.81
4	23.81	1.19	7.55	8.74	32.55
5	32.55	1.63	7.55	9.18	41.73
6	41.73	2.09	7.55	9.64	51.37
7	51.37	2.57	7.55	10.12	61.49
8	61.49	3.08	7.55	10.63	72.12
9	72.12	3.61	7.55	11.16	83.28
10	83.28	4.17	7.55	11.72	95.00
Total	. . .	\$19.50	\$75.50	\$95.00	

The amounts in column (4) are charged to Depreciation Expense and credited to Allowance for Depreciation for each year. The same amount is placed in a special fund and the entries are a debit to Depreciation Fund and a credit to Cash. The total charge to expense in this way is \$75.50 during the ten years. The additional \$19.50 necessary to bring the fund up to the required amount is obtained through the interest earned on the fund as shown in column (3). It is customary to record the receipt of these funds as follows,

Depreciation Fund . . . . .	\$ .38	
Allowance for Depreciation . . . . .		\$ .38

the amount of the entries being the figures shown for the different years in column (3). The debit is made to a fund account (asset) and the credit to a valuation account. This shows the fact that the operating expenses cover the annuity charges exclusive of interest while the remainder of the total depreciation is raised from outside sources.

The fact that a lesser sum than the total depreciation is charged to expense accounts has often led to the erroneous conclusion that this is a cheaper method of accounting for depreciation than the straight line or other methods. It is said that it costs the company only \$75.50 to raise a fund of \$95.00 and the expense figures are submitted as evidence. Such reasoning results from merely looking at the superficial aspects of the case. It is true that expense is charged with the smaller amount and that the fund accumulates to the larger, but in the entries which are made the accumulation of interest (which is a revenue) is credited to a valuation account. Failure to credit revenue to a revenue account has the same net effect on the available net revenue as though the revenue account had been credited and expense charged for the larger sum. To illustrate the point, the interest received might have been credited to the Interest account as follows and the increase in the fund through interest shown by the entries,

Depreciation Fund . . . . .	\$ .38	
Interest . . . . .		\$ .38

Now in order to increase the valuation account by the proper amount, these entries must be made,

Depreciation Expense . . . . .	\$ .38	
Allowance for Depreciation . . . . .		\$ .38

If these two journal entries were made for the sums shown in column (3) there could be no question about the total cost under the sinking fund method being equal to the total depreciation. Yet the net effect on the net revenue available for distribution to the equities is the same under the former case as in the latter.

The absurdity of the claim can be seen, however, without resort to an accounting demonstration. If a certain amount must be available at a certain date in the future for any purpose it must be advanced in some form by the investors. Funds do not drop from the skies. Either new investments are made by the investor or revenue from a present investment is allowed to accumulate. Any other situation would be impossible in ordinary commercial practice unless a gift were made by some one other than an investor. The cost to the investor is equal to the total depreciation.

The sinking fund method produces the results desired when a special fund is set aside. This special fund is advisable, as was shown in the last chapter, only (1) for a terminable enterprise to retire the securities at par when the assets are exhausted, or (2) for a continuous enterprise when the funds are not needed for additions and betterments.

#### THE COMPOUND INTEREST METHOD

The valuation committee of the American Society of Civil Engineers has given the name *compound interest* to a method which applies the sinking fund principle to cases where funds are used for additions to the property.<sup>1</sup> It is recognized that if the sums retained by the depreciation charge are re-invested in the property a revenue will result from the investment. That is, by increasing any of the factors, the product

<sup>1</sup> See Report of the Special Committee to Formulate Principles and Methods for the Valuation of Railroads and other Public Utilities, Publication of the American Society of Civil Engineers, Oct. 28, 1916, page 1861.



will increase, thus bringing in net revenue on the investment. The additional revenue thus obtained is the same in nature as the interest earned on the fund in the sinking fund method. In this case, however, the income on the fund is received in the general revenue resulting from the sale of product or service. It is not specifically earmarked, "interest on depreciation fund," but is a part of the gross revenue of the concern.

It may be assumed with propriety that the amount of revenue which can be attributed to the fund thus reinvested is equal in amount to the interest which would be paid for a loan of capital for the same purpose. Since this is credited to gross revenue, the amount of the interest computation each year must be charged to Depreciation Expense. The method may be illustrated by using the example given for the sinking fund method in the preceding section. The total depreciation on the machine is \$95 and the period is ten years. It is assumed that the interest rate on capital borrowed for this type of business is five per cent. The first step is to find the annuity which will accumulate to \$95 in ten years at five per cent. This is, as was shown above, \$7.55. This is the charge for depreciation the first year, thus,

Depreciation Expense . . . . .	\$7.55	
Allowance for Depreciation . . . . .		\$7.55

No other specific entry is made but the amount thus reserved is used in business operations. Now at the end of the second year the same annuity charge is made for depreciation and in addition the amount which is earned on the \$7.55 previously charged, \$38. The entries then would be,

Depreciation Expense . . . . .	\$7.93	
Allowance for Depreciation . . . . .		\$7.93

Then at the next year the entry will be \$7.55 plus the interest on all that has been reserved up to this time. At each succeeding year the same method is applied to determine the amount of the charge. The amount of the charge to Depreciation Expense for each year is the sum of the annuity and the interest for the corresponding year under the sinking fund method. For the example being considered, these amounts are shown in column

(5) of the table on page 515. The effect on the available net revenue is the same as under the sinking fund method for the same rate of interest. It is possible, of course, that the rate of interest used in the compound interest method may be higher than for the sinking fund method. In the former the rate is determined by the interest rate for investments in the individual concern while in the latter it is determined by the interest rate on conservative investments in other concerns.

It is sometimes said that this is an increasing charge method as the expense for depreciation increases from year to year. But the person who makes this statement is simply looking at the growth of the expense charge entry and fails to take into consideration the fact that gross revenues are increasing (with respect to the asset item) at least proportionately. In other words, a part of the net revenue from the reinvested funds is considered as a part of the gross revenue of the old asset. The actual expense of keeping the asset in service caused by depreciation therefore is the same each year. This is probably the reason that the compound interest method was originally called the *equal annual payment* method in the preliminary report of the committee in 1913.

The question might be raised as to whether interest in this case is not being charged as an expense which should instead be charged against net revenue. That is, since the increase in the depreciation charge is obtained by an interest computation, the additional amount is interest. This, however, is not the case. Interest chargeable to net revenue is contractual interest, a distribution to the equities. There is no distribution to the equities in this case. The amount charged is a part of total depreciation which is an expense. Interest calculations are brought in simply as a method of computing expense charges between accounting periods. The amount is not a return on capital but a return of capital. The reason for using the interest computation has been shown. This is simply a recognition of the fact that time is consumed between the returns of the parts of the investment in a fixed asset and the use of the funds returned for replacement purposes. The productive use of these funds in the meantime in the enterprise is taken into account through the computations referred to.

The compound interest method is the most accurate for accounting for depreciation of a durable physical asset when the funds reserved are reinvested in the business. It makes a correction of the straight line method in that it recognizes the interest element. One observation may be made in comparing these two methods. As the rate of interest employed in the compound interest method is reduced the charges approach the straight line charges as a limit. If the rate of interest were taken as zero as an extreme case the two methods would be identical. When the rate of interest which might be employed is very small and the possibility of error in estimating the service life of an item is large, there is little to choose between the two. With greater precision in estimating service life, however, the compound interest method is the more accurate.

#### PRESENT VALUE OF FUTURE REVENUE METHOD

The *present value of future revenue* method may be used for measuring depreciation of any asset the revenue from which is known in advance. This is true of the intangible assets as a class, and as was shown in Chapter XVIII is also true of securities owned. The original value or purchase price is based upon the revenue to which the asset gives title. It is the present value of these sums at the market rate of interest which determines the purchase price. Then the value at the end of each accounting period throughout the life of the property item is the discounted value of the remaining future revenue items. Suppose, for example, that the X Company purchases a patent right from Y which gives an advantage over all competitors equal to \$500 per year and that this advantage will be maintained for a period of ten years, after which the right expires. The purchase price of this asset will be the discounted value of the ten \$500 revenues attributable to the patent right at the market rate of interest for this form of investment. If the rate were six per cent the purchase price and original value would be \$3,680.04. The value at the end of the first year would be found by discounting the remaining nine revenue items at six per cent which gives \$3,400.85. The depreciation for the year is the difference between the two quantities or \$279.19. The depreciation for each succeeding

year would be found in the same way. The following table shows the book value at the beginning of each year based on the present value of the future revenues, the revenue received during the year, the depreciation charge, the net revenue from the item and the rate of net revenue to the book value for the year.

(1) YEAR	(2) BOOK VALUE BEGINNING OF YEAR	(3) REVENUE	(4) DEPRECIATION CHARGE DURING YEAR	(5) NET REVENUE	(6) RATE OF NET REVENUE TO BOOK VALUE
1	\$3,680.04	\$500	\$279.19	\$220.81	6%
2	3,400.85	500	295.95	204.05	6
3	3,104.90	500	313.71	186.29	6
4	2,791.19	500	332.53	167.47	6
5	2,458.66	500	352.48	147.52	6
6	2,106.18	500	373.63	126.37	6
7	1,732.55	500	396.04	103.96	6
8	1,336.51	500	419.81	80.19	6
9	916.70	500	445.00	55.00	6
10	471.70	500	471.70	28.30	6
Total . . . .		\$5,000	\$3,680.04	\$1,319.96	

There are two facts of particular significance in this table. In the first place, the rate of net revenue to book value remains constant throughout the whole period as shown in column (6). This, of course, must necessarily be the case since the same rate is used each year for determining the present values of future revenue. If the market rate of interest for the type of asset being considered should change, however, there would be a change in the rate realized, a result brought about by using the new rate in obtaining the present values of the sums.

In the second place column (4), showing the depreciation for each year, gives the same figures as would be obtained through using the compound interest method at the same rate of interest. That is, if the six per cent rate of interest were used for the compound interest rate for an asset which cost \$3,680.04, had a service life of ten years and no salvage value, the depreciation charges would be the same as those shown for the present value of future revenue method. The reason for this may readily be seen. In this case \$3,680.04 is the present value of an annuity of

\$500 per year for ten years at six per cent and column (4) of this table is that part of the revenue items which represents the return of investment. The return of the investment in an annuity always progresses in conformity with the growth of a sinking fund.<sup>1</sup> The compound interest charges also proceed in conformity with the growth of a sinking fund. Therefore the depreciation charges under the present value of future revenue method and the compound interest method are the same in case the revenue from the asset is an annuity.

The present value of future revenue method does not, however, always give the same results as the compound interest method. In case the revenues do not constitute an annuity, the methods differ. Suppose, for example, that some form of intangible asset is purchased which will bring in \$25 the first year; \$25, the second; \$20, the third; \$20, the fourth; nothing, the fifth; \$18, the sixth; \$18, the seventh; \$14, the eighth; \$14, the ninth; and \$22, the tenth, and that the purchase price is made on a five per cent basis. The price would be the sum of the present values of each of the sums at a five per cent rate of interest, and this gives \$138.45. The following table represents the same information for this asset on the present value of future revenue method as was given in the preceding table.

(1) YEAR	(2) BOOK VALUE BEGINNING OF YEAR	(3) REVENUE	(4) DEPRECIATION CHARGE	(5) NET REVENUE	(6) RATE OF NET REVENUE TO BOOK VALUE
1	\$138.45	\$25.00	\$18.08	\$6.92	5%
2	120.37	25.00	18.98	6.02	5
3	101.39	20.00	14.93	5.07	5
4	86.46	20.00	15.68	4.32	5
5	70.78	0.00	—3.54	3.54	5
6	74.32	18.00	14.29	3.71	5
7	60.03	18.00	15.00	3.00	5
8	45.03	14.00	11.75	2.25	5
9	33.28	14.00	12.33	1.67	5
10	20.95	22.00	20.95	1.05	5
Total . . . .		\$176.00	\$138.45	\$37.55	

<sup>1</sup> See table for apportionment of annuity payments on page 377.

The values in column (2) are found by obtaining the discounted values of the remaining revenue items at the beginning of each year. Column (3) is the revenue for each year, column (4), the depreciation (difference between book value beginning and end of each year), column (5), the net revenue, and column (6), the rate of net revenue to book value. Column (6) shows the rate to be constant again at five per cent. This would necessarily be the case if five per cent were used in the valuation throughout ten years.

It should be noted that in the fifth year there is no revenue and that during that year the property appreciates by \$3.54, and this gives a return of five per cent on the investment. It would seem that to increase the property valuation during a year when there is no revenue is improper, but if the assumption be accepted that the value is determined by the future revenues, the property *actually* appreciates during the fifth year. There are five remaining revenues at the beginning of the fifth year, the same five revenues are remaining at the end of the fifth year, but are all one year nearer and are, therefore, more valuable.

The entries for the fifth year would be the reverse of those for other years. That is, the book value would be increased by a debit to Allowance for Depreciation and a credit to Revenue (the opposite of a charge to Depreciation Expense) thus,

Allowance for Depreciation . . . . .	\$3.54	
Revenue (from Appreciation) . . . .		\$3.54

This is an extreme case, for it is doubtful whether many intangible assets are sold where the revenues of such unequal amounts are definitely known in advance. The case is possible, however, and the illustration serves to show how this method differs from the compound interest method. Changes in the amount of revenue directly attributable to the asset are the basis for changes in the value of the asset. In the case of the compound interest method, no attempt is made to determine the revenue attributable to the asset, and the depreciation charges are based on the cost figures.

The present value of the future revenue method is the proper

one for use in the case of intangible assets, or other assets where the purchase and sale price depends on the discounting of the revenues applicable to the asset. It cannot be applied to physical property items, however, and this fact must be emphasized. It has been suggested that this method, producing as it does a uniform flow of net revenue, should be applied in principle to the tangible assets in order to produce an even flow of net revenue from such property; but this argument is unsound. In the first place it is impossible to forecast the revenues from a physical property item or even to determine the amount attributable to such an asset. This would prohibit the use of this method on a scientific basis. At best it would only be possible to vary the depreciation charges directly with the gross revenue figure and this would be indeed a rough approximation. Further, it is not the purpose of depreciation accounts to equalize the net revenue figure as was stated earlier in the chapter. Net revenue from the use of productive agents does fluctuate from year to year and the accounts should show this fact. As well juggle the labor expense accounts to produce an even flow of net revenue as the depreciation accounts. Depreciation charges in the case of physical property items must be based upon cost figures without reference to revenue.

#### MISCELLANEOUS METHODS

The methods which have been described are the most important. One or another will fit the ordinary cases which arise in practice. There are a great many other methods which have been suggested at various times, however, some of which will bear mentioning.

It is sometimes suggested that repair charges be included in the calculation of the depreciation computation. Repairs, it is said, constitute a replacement of a part of the value of a property item and consequently make good some depreciation; and it is urged that in many cases it is found that the repair charges do not spread evenly over the service life of an item. A locomotive, for example, will have only minor repairs for a period of three or four years and then be placed in the shops for a

general overhauling necessitating heavy repair charges. These charges make good a certain amount of depreciation of the preceding four years, and it is said that they should be spread in the expense accounts of those years instead of being charged all in the one year as is done according to current practice. In general this plea is that the depreciation charge should be sufficient to cover the repair costs as well as the renewal, and there is considerable force to this argument since in many cases in practice the repair charges fluctuate very greatly from year to year. In general, however, the error consists in choosing too large a unit for accounting purposes. It was shown in the last chapter that the distinction between repairs and renewals is arbitrarily based on the definition of the unit. If it is found that the repair charges do vary disproportionately between periods, a change in the choice of the unit may remedy the situation. Instead of considering the locomotive as a unit, for example, the different parts may be accounted for on this basis. There must be some line drawn for practical purposes, however, and it would be inadvisable to make the units so small that all repairs would be accounted for in this way as the distinction between repairs and renewals is of sufficient importance to warrant its retention.

The annuity method is also worthy of mention because it is advocated by several accountants. This is very similar to the compound interest method. The difference consists in adding to the compound interest charge an amount to cover interest on the book value. This additional amount is charged to the Depreciation Expense account but is credited to Interest instead of Allowance for Depreciation. The following table will serve to make the method clear. This represents the book value, interest on the book value, depreciation, and the expense charge for each year in the case of a machine which costs \$100, will last ten years, and has a salvage value of \$5. The interest rate of five per cent is used in the computation. Column (4) shows the net depreciation, which corresponds to the charge under the compound interest method; column (3) shows the interest on the book value for each year, and column (5) shows the amount charged to Depreciation Expense, the sum of the items in columns (3) and (4).



(1) YEAR	(2) BOOK VALUE BEGINNING OF YEAR	(3) INTEREST ON BOOK VALUE	(4) NET DEPRECIATION	(5) EXPENSE CHARGE (3)+(4)
1	\$100.00	\$5.00	\$7.55	\$12.55
2	92.45	4.62	7.93	12.55
3	84.52	4.22	8.33	12.55
4	76.19	3.81	8.74	12.55
5	67.45	3.37	9.18	12.55
6	58.27	2.91	9.64	12.55
7	48.63	2.43	10.12	12.55
8	38.51	1.92	10.63	12.55
9	27.88	1.39	11.16	12.55
10	16.72	.83	11.72	12.55
Total . . . . .		\$30.50	\$95.00	\$125.50

The journal entries for the first year would be,

Depreciation Expense . . . . .	\$12.55	
Allowance for Depreciation . . . . .		\$7.55
Interest . . . . .		5.00

Each succeeding year, the entries would be the same in form, the debit to Depreciation Expense always being \$12.55 (hence the name annuity method), the amount in column (4) being credited to Allowance for Depreciation, and the amount in column (3) to Interest. It may easily be seen that the net effect of this method on the available net revenue and also on book value is the same as under the compound interest method. There is a fundamental error involved in the plan, however, and that is in including interest on invested capital in the expense accounts. The amount in column (3) is charged to expense and immediately credited as a net revenue item. It represents the services of the equities in investing these funds in machinery. To consider such services as expenses in the accounts is, as has been shown before, an illogical procedure.

Several other rather arbitrary methods have been devised for spreading depreciation on what is supposed to correspond to the ability of the revenue to stand the charge. One of these is the fixed percentage of declining value method. A percentage figure is found which applied consecutively to book value at the begin-

ning of each year will reduce that figure from cost to salvage value during the service life. The charges during the first years are large but the amount continually decreases until the last year, as it is supposed that revenues can stand heavy charges during the early years and lighter ones during later years. Very little can be said for this method, since revenue should not be a controlling factor in fixing depreciation charges as has been shown before.

A further discussion of different methods would be out of place in this text. Those given serve to illustrate the divergence of practice; and, as was stated earlier, the methods described in the preceding sections are adequate for all cases. The particular conditions which make one or another form advisable were stated in the different sections.

## XXIV

### THE INTANGIBLE ASSETS

THE point has been emphasized repeatedly in the preceding pages that property is a category which includes both material and immaterial items. It has been shown further that another important line of division groups all properties into fixed assets and current assets. Such items as prepaid insurance or similar deferred assets, and rights such as accounts receivable, are examples of current immaterial assets. Current assets of all types furnish less difficult problems of valuation than arise in the case of the fixed assets as has been explained. The treatment of current intangibles has already been sufficiently discussed, and the valuation of long-term rights such as bonds and similar securities was quite fully considered in Chapter XVIII. Thus far little attention has been given, however, to the fixed intangibles proper — goodwill, going value, patents, etc. In the present chapter the nature and treatment of these assets will be discussed.

#### THE NATURE OF GOODWILL

The rates of return realized on the capital invested in production vary widely between different enterprises, — even in the same industry. In the manufacture of furniture, for example, one firm will be earning five per cent on the investment, another six per cent, still another ten per cent, and so on. The conditions leading to business success are very complex, and hence it should be recognized that the amount of capital invested in any case is only one of the elements determining the amount of net revenue. Managerial ability, methods and processes, territorial location, trade name, selling organization — these and many other factors contribute to financial success. Some enterprises

possess a superior equipment as compared with their competitors in regard to such factors. Such enterprises may be said to have *goodwill*. Goodwill may then be defined as the capitalized value of the excess income which a particular firm, because of greater efficiency or any monopolistic advantages, is able to realize over a normal enterprise in the same industry and having the same capital investment. By a normal enterprise is meant an enterprise that is earning a rate of return high enough to attract a proper flow of capital to the industry in question.

It may be assumed, for example, that the A Co. has \$1,000,000 of capital invested, and earns a net revenue of \$80,000 per year. This gives a rate of eight per cent on the investment, which, it will be supposed, is the rate of return necessary to attract the investor to this field of production. The B Co. has also invested \$1,000,000 in the same industry but earns \$160,000 annually, giving a rate of sixteen per cent. Now it is evident that the property of the B Co., because of all the conditions that go with it, is worth twice as much from the standpoint of a prospective investor as the property of the A Co.; for the final test of the value of any property from this standpoint is its earning power. The original investment is the same in both cases, but the advantages of the B Co. are such that it possesses twice the earning power of the other company. (Permanence of income, conditions of risk, etc., are also assumed to be the same in both cases.) The B Co. may then be said to have an intangible asset due to one or more factors that give it an advantage over the normal enterprise. Goodwill might be again defined, then, as the capitalization of a *differential profit* which a particular enterprise enjoys.

Defined thus broadly goodwill includes the value of all such intangibles as patents, copyrights, trademarks, franchises, etc. Where such definite items exist, however, it may be desirable to restrict goodwill to the value of the more general monopolistic advantages such as location, and of the peculiar efficiency or prestige attaching to the particular enterprise. Illegitimate practices in restraint of trade may evidently lead to a large intangible item which might be considered a kind of goodwill.

An exceptional rate of income permanently assured is not essential to the origin of goodwill. The assurance of huge earn-

ings for a few years, or even a single year, adds to the value of the property involved.

Goodwill is often transferable, as is any asset. In some cases, however, goodwill is dependent upon the personnel of the proprietors. In such a case this asset measures the capital value of the business qualities and characteristics of a certain individual or group of individuals attached to a business enterprise. This situation occurs most frequently in sole-proprietor enterprises and in partnerships. The proprietors in such a case often give a value to their firm because of the personal esteem with which they are regarded by their customers. Or the business may be one which requires peculiar skill, in which case the success of the enterprise depends largely upon the knowledge of the business which the original owners possess. In all such cases it is not possible to transfer goodwill from one business to another unless the change is nominal as far as the personnel of the owners is concerned. When, however, goodwill depends upon a trade name, a copyright, market conditions, secret processes, etc., it is usually possible to transfer the asset from one enterprise to another.

It is evident that the exact determination of the amount of goodwill in a particular case may be a matter of considerable difficulty. The definition given above involves the ascertaining of the normal competitive rate of income in the industry in question and the number of years during which the excess income can be expected to accrue. Whenever goodwill is purchased, however, such valuations are actually made. The difficulty of setting a reasonable value upon goodwill outside of an actual transaction is one reason for the prejudice against the recognition of this asset except as purchased. The problems of valuation arising in connection with goodwill will be considered in the next section.

#### THE VALUATION OF GOODWILL

Although according to the definition given in the preceding section goodwill as an economic fact may originate without cost, it is not considered good practice to recognize this asset in the accounts unless it is purchased. This may seem at first sight an unreasonable view, but it is consistent with the principles of

valuation developed in preceding chapters. Goodwill, as has been explained, is based upon an unusual rate of income. It is the capitalization of the peculiar advantages which a particular firm enjoys. If goodwill were generally recognized as an asset in the accounts of all enterprises in a given industry there would be no unusual rates of return. The most successful firm would earn no more than the ordinary competitive rate of return. As regards income rates all supra-marginal enterprises would be reduced to the level of the marginal business. The actual situation would seem to be obscured by such a practice.

To capitalize an excess earning power and enter the result in the books as an asset would be a practice similar to the recognition of interest accruing during construction. The objections already made to such a procedure can be applied with equal force to the capitalization of unusual earning power. Such a practice again means the accruing of the services furnished by the owners themselves (or the peculiar advantages possessed by the owners) as an asset. This, it has been insisted, is not the function of the accounts. The accounts should follow the actual investment of the owners as it takes shape in various commodities and services purchased, but should not show the capitalization of the peculiar functions and advantages inhering in the particular enterprise itself. The actual rate of return is the significant fact for the proprietor. He wishes to know just what the capital fund in his possession is yielding, and if the rate is reduced to a nominal level by the capitalization of a part of income the actual situation is covered up.

This view is not inconsistent in any way with the theory that changes marketwise in the assets owned by an enterprise should be followed in the accounts. The recognition of depreciation and appreciation makes the capital accounts conform to the actual situation, and accounting for appreciation should not be confused with the capitalization of income. If the accounts are to present a correct showing of invested capital (actual assets donated included) and thus give the manager a basis for judgments in connection with the proper utilization of resources, all value changes must be recognized as far as this is practicable. But capitalized income is not an asset value in this sense. As was emphasized in Chapter XX and elsewhere the accounts

should show the investor the actual rate of return realized on the economic resources possessed by the enterprise. If this rate is twenty per cent in a particular year the asset accounts should be consistent with this fact. If the rate is ten per cent the accounts should conform to the actual situation. Accounting which attempts to iron out the fluctuations in net revenue in a particular enterprise, or to reduce the rates realized by different enterprises to the same level, if not actually improper, is at least not to be commended.

If, on the other hand, a particular enterprise buys the assets of another company and pays something in excess of the value of its plant and equipment in order to secure certain advantages which give an exceptional earning power, in this case an investment is actually made in goodwill and it becomes an intangible asset on the books of the purchaser. It may seem that this shifts the basis of valuation, but this is not really the case. As was explained in Chapter XIX an enterprise which invests \$100,000 in the construction of a plant has a property which should be entered in the accounts at that figure. If at the end of the construction period the completed plant is sold to another company for \$106,000, the new company should value the property at \$106,000, for it has purchased the service of the construction company. But this does not justify the capitalization of the construction company's service in its own accounts. Similarly an enterprise which because of exceptional advantages earns a very high rate of return is not justified in capitalizing a part of that return even though it may be possible to dispose of these advantages at a price under certain conditions.

It is not intended to deny the importance of the capitalization process as an economic fact but it does not seem reasonable or practicable to capitalize in the accounts of an enterprise any part of its income.

Goodwill is frequently made use of in accounting practice to validate security issues. Often the par value of the securities issued exceeds the actual value of the property acquired. In such cases it is common practice to label the amount of the discrepancy goodwill. This practice is evidently improper, for the goodwill in such a case is entirely fictitious. As was stated in a preceding chapter discount on stock should be used to represent the excess

of the par value of stock and other securities issued over the value of the property acquired. Frequently some general title such as "property, goodwill, royalties, etc.," is used on the balance sheet. This is still more questionable, for such a heading does not show even the estimated amount of goodwill.

Often when a partnership or corporation is taken over by another concern, something is paid for goodwill, even though this asset has not been previously recognized on the books of the original concern. If actual property is paid for this asset, then it is entirely proper to list it on the books of the buyer (especially if the purchase took place under competitive conditions); but it should be recorded in a distinct account and for the amount actually paid. Very often the payment made is in securities with only a nominal value, and hence the goodwill is fictitious.

The later treatment of goodwill in the accounts raises some interesting questions. If the special advantages purchased are permanent the asset goodwill evidently need not be depreciated. Peculiar efficiency and monopolistic advantages, however, are seldom permanent factors and hence the problem of depreciating goodwill arises in most cases. When the advantages purchased disappear, goodwill should be written down. If goodwill is based upon definite terminable rights such as leases or patents it should be amortized during the life of these rights. Such rights are not goodwill in a strict sense, however, and will be further considered in a later section of this chapter.

If a decline in income is expected, and occurs because of the decay of physical property or because some condition or privilege upon which goodwill depends covers a definite period of years, then goodwill can be amortized as is any asset by depreciation charges against revenue based upon some appropriate method of apportionment. It is sometimes objected that it is unreasonable to write off goodwill when revenues are declining as this further impairs net revenue, and that goodwill accordingly should be charged against revenues in boom years or against accumulated surplus as rapidly as possible. Such a practice can hardly be commended. Certainly the logical position to take is that the accounts should express as nearly as possible the actual situation. Goodwill should not be left on the books when it is known that the



asset no longer exists, and it need not be amortized unless depreciation actually occurs.

To be consistent with the view that goodwill should not be recognized unless purchased it should be insisted that goodwill can never appreciate. Any added earning power over and above the return secured by the original purchase of goodwill is due to the peculiar efficiency or other advantages possessed by the new enterprise and should be reflected by a higher rate on the investment, and not by charges to the asset accounts.

The peculiar advantages which one enterprise possesses as compared with another are reflected more or less accurately in the market price of its securities. The prices of stocks and bonds are naturally based to a considerable extent upon market income rates. The selling price of the stock of a metropolitan newspaper company, for example, may be far above the book value of the stock. The balance sheet of the B Co., for example, appears as follows :

Property . . . . .	\$1,250,000	Capital Stock . . . . .	\$1,000,000
		Surplus . . . . .	250,000
	<u>\$1,250,000</u>		<u>\$1,250,000</u>

The par of the B Co.'s stock is \$100 and the book value is \$125 per share. Total proprietorship as shown by the accounts is then \$1,250,000. On the market, it will be assumed, this stock sells for \$200 per share. According to the market valuation proprietorship amounts to \$2,000,000. The difference of \$750,000 between the two valuations may be called goodwill. If the balance sheet were revised by the recognition of this intangible it might appear as follows :

Property . . . . .	\$1,250,000	Capital Stock . . . . .	\$1,000,000
Goodwill . . . . .	750,000	Surplus . . . . .	250,000
		Goodwill Surplus . . . . .	750,000
	<u>\$2,000,000</u>		<u>\$2,000,000</u>

As has been explained, however, no purpose is served by the recognition in the accounts of security prices or any phase of goodwill unless the item has been purchased.

## GOING VALUE

The interval from the time a business enterprise is originally projected to the time the firm begins to earn a normal return on the investment may be divided into two periods: (1) the period extending from the time the first steps by the promoter are taken to the time when the concern begins to earn revenue; (2) the period extending from the time when revenue first accrues to the time when a normal return on the investment is realized. The first period constitutes the organization and construction period and is common to all enterprises; while the second represents the pioneering or experimental period and does not confront all new enterprises in old established lines. The distinction between the two periods cannot always be sharply drawn, but it is an important general distinction to be kept in mind in analyzing the nature of *going value*.

It was explained in Chapter XIX that the costs of promotion, incorporation fees, underwriters' charges, costs of preliminary advertising, etc., are all outlays essential to the finished plant and organization, ready for operation. Such charges are as legitimate capital outlays as the cost of labor and materials entering directly into the tangible property items. These items are a necessary cost of property and are intangible only in that it is not convenient to allocate them to specific tangible units although they are incident to the property as a whole. Going value, if used to express the sum total of general organization and construction costs, is a bona fide asset.

Going value,<sup>1</sup> however, is more commonly used to express the capitalized value of early capital losses and unrealized income. In the development of a new enterprise a considerable interval often elapses between the time that revenue actually begins to accrue and the time that a *normal* rate of income is earned. Sometimes the wheels have been turning for several years following the completion of the plant before the business is put upon a paying basis. This is particularly true of industries in what might be called the experimental stage. Many of the electric power companies, for example, failed to realize a normal rate

<sup>1</sup> Developmental value, pioneering value, experimental value, and going value are expressions which are used more or less synonymously.

of net revenue in the early years of the industry ; and in some cases actual capital losses were suffered. This was due to the lack of a brisk demand for the product, to the rapidity of mechanical changes in equipment, and to the high costs due to inexperienced management. On the theory that the investor is entitled to a fair return on his investment it has been urged that there is, in such cases, a developmental or going value representing the capitalization of the early losses of the enterprise.

This theory is of significance primarily in connection with the regulation of the rates of public utilities. The problem in such cases is so to adjust prices that the investor in such properties will neither be discriminated against nor advantaged as compared with his fellow investor in competitive lines which involve the same burdens as regards risk and other aspects of ownership. If the investor in competitive lines is able to recover pioneering losses, then the investor in public utilities should be allowed to do so. It is doubtful, however, if in competitive enterprises the investor *is* always able to recompense himself for early losses in later higher prices. If *all* investors in a certain industry suffered losses (or did not realize the normal return afforded by general business) for a given period, it might seem reasonable to conclude that prices would later be high enough to cover the early losses. Even in such a case this conclusion is questionable. Once the industry in question becomes established can the early investors charge higher prices because of previous losses? Would not capital flow from other lines into the now established industry and drive prices down to a point at which a normal return was realized? There is no definite assurance in the market situation that the investor in the specific enterprise will be able to recoup early losses in later prosperous years. One enterprise may prove ultimately successful while another enterprise may never yield a fair return. It is a familiar fact that in certain hazardous lines more capital is dissipated in unsuccessful ventures than is earned by successful companies. In other words from the standpoint of capital return the industry as a whole in such a case is operating at a net loss.

Business losses whether due to experiments, changes in demand, inefficiency, or to any other cause, cannot be recovered by the specific enterprise bearing such losses (unless monopolistic

conditions prevail). These are among the risks of ownership which require at least the *prospect* of net revenue to attract capital. Net revenue in general, it is true, is the economic burden which the community bears to secure the services of ownership. The possibility of losses during the developmental period or of ultimate failure is one of the reasons for the existence of a net return to the owners in prices. But net revenue is not guaranteed in all cases; and if it were one of the reasons for the existence of the residuum over expense charges would be destroyed.

Even if it were true that the normal competitive enterprise is able to realize an income in later years sufficient to offset the early lean years this would not be an adequate reason for capitalizing early losses and entering the result as an intangible asset in the accounts. This would simply be the capitalization of a phase of income and is open to the same objections already urged against the recognition of goodwill (unless purchased) and interest during construction. The capital funds of the enterprise are not accruing each year at the normal competitive rate of interest. It is true that the investor hopes to realize a sufficiently high rate later to make up for the lean periods, but even if the large earnings are definitely assured would it not obscure the actual situation to capitalize the earnings when still unrealized? All such accounting, as previously explained, tends toward the elimination of the fluctuations in the rate of income.

In certain cases of publicly regulated enterprises, however, such an intangible asset may with reason be allowed. The determination of a fair *rate* of income is the important question in such cases. If the rates prescribed by law have been lower than the rates which would have normally been earned, or if the investor is restricted, in other words, to a non-speculative rate of return, then he should be allowed to recover early losses in later higher prices. One way of accomplishing this end is to allow the company to charge its customers prices which will yield a fair return not only on actual investment but upon capitalized losses and unrealized income as well. Even in such a case, however, the matter is a question for judicial as well as accounting opinion. There seems to be sufficient ground for

excluding developmental value from the accounts with the possible exception of this case.

#### MISCELLANEOUS INTANGIBLES

There are a number of specific conditions and rights which give rise to important intangible assets. Some of these assets can be included under the general head, goodwill; but it usually is more desirable to use a distinct account for each asset. A brief discussion of a few of the more important examples will be given in this section.

Special privileges granted by the state to specific enterprises often give rise to exceptional earning power and hence have an important value. Of these privileges the patent right is the most important. A patent is a grant by the state conferring exclusive privileges for a specified length of time in connection with the production and sale of some product or exclusive right to some method or process of production. It gives to the grantee a monopoly in the manufacture and sale of some invention or in the use of some device. The real test as to whether a patent has value or not is not its cost but its earning power as in the case of any fixed intangible. It is considered advisable, however, to enter a patent on the books at the cost of the experiments that gave rise to it, and the clerical fees necessary to secure it, in anticipation of the financial success of the device involved. When a corporation organizes and buys out an invention, for example, the patent right is entered at the purchase price. If the sale has been a bona fide transaction on a cash or an equivalent basis the success of the invention is usually reasonably assured, and the price paid is the capitalized value of the expected earning power.

Until the success of the enterprise has been actually tested it would seem somewhat unreasonable to list patents as an asset at anything above cost. There is less reason for objecting to the recognition of patent rights at actual market value, however, than to the entry of goodwill due to peculiar prestige and efficiency. A patent right is a definite possession, often highly marketable, and to capitalize its earning power in the accounts would not mean in any sense the accruing of the services or

*personal* advantages of the proprietors as an asset. If a patent right comes to be worth a large amount although costing practically nothing there is no very substantial objection to its recognition at a conservative valuation. A firm, for example, may own no other property than a patent right which cost but a nominal sum and yet the lease of this right to other parties may give rise to a considerable income. It would be entirely legitimate in such a case to consider as an asset either the patent right or the contracts based upon this right.

Patents are often used as an asset at organization to validate large issues of securities. If the success of the patent is reasonably assured this practice can be justified. But hundreds of patents are taken out which never become the basis of profitable enterprises. The real value of a patent depends upon the earning power which it gives to an enterprise, and it is when this earning power is known or assured that it can properly be considered as an asset.

Since patents are terminable rights such assets should be amortized during the life of the privilege in any case. Patents run for various terms of years. A mechanical patent runs for seventeen years in the United States and can be renewed under certain conditions. In the amortization of patents earning power and length of life are the important elements to be considered. If the rate of return realized falls because of other improvements such assets should be depreciated even if the privilege involved has not legally expired. When income can be determined in advance with reasonable accuracy a patent may be amortized by the present value of future revenue method.

Trademark and copyright privileges give rise to assets similar to patent values.

Another class of intangible assets is based upon leases and similar private contracts. These assets are more definite in character than most intangibles. Suppose, for example, that the owner of a mining property leases this property to an operating company for fifty years, the annual consideration being \$5,000.<sup>1</sup> The lease contract would represent an asset to the lessor similar to an annuity. The value of fifty annual sums

<sup>1</sup> For convenience it will be assumed that at the end of fifty years the value of the property will be exhausted.

of \$5,000 each on a six per cent basis is \$78,809.30. Such a lease amounts virtually to a sale and the value of the lease may now appear on the lessor's books rather than the mining property. The balance sheet of the lessor with respect to this single item would appear somewhat as follows :

Lease . . . . .	\$78,809.30	Lessor, Proprietor . .	\$78,809.30
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The value of the lease should be amortized by the present value of future revenue method. The entries recognizing the item of depreciation for the first year would be :

Lease Depreciation . . . . .	\$271.44	
Lease (or Reserve for Depreciation)		\$271.44

(The amount of depreciation may conveniently be found by subtracting six per cent of \$78,809.30 from the amount of the annual payment.) When the annual rent is received the entries would be as follows :

Cash . . . . .	\$5,000	
Rent . . . . .		\$5,000

The gross revenue appearing in the Rent account less the item of depreciation gives \$4,728.56, or six per cent on the original lease value.<sup>1</sup>

Where the lessee pays a lump sum in advance a somewhat different intangible asset arises on the books of the lessee. The amount of the prepayment is an asset since the service purchased will not be exhausted for several fiscal periods. Such an asset is another illustration of the deferred debit discussed in Chapter X. Suppose a railroad company, for example, leases the road of a small line for ten years, paying for the lease a lump sum of \$250,000. The expenditure would be entered as follows :

Lease . . . . .	\$250,000	
Cash . . . . .		\$250,000

<sup>1</sup> The entries in this case might evidently be contracted to the following :

Cash . . . . .	\$5,000	
Lease . . . . .		\$ 271.44
Net Revenue . . . . .		4,728.56

Each year a portion of the original payment would be considered an expense. If the asset were amortized according to the compound interest method at six per cent the entries for the first year would be :

Depreciation Expense . . . .	\$18,966.99	
Lease (or Reserve for Depreciation)		\$18,966.99

In certain cases it might be urged that a lease constitutes an asset on the books of the lessee even when the consideration is an annual payment. Thus the lessee in the last case above mentioned might consider the right to use the leased property of considerable "strategic value," and hence deem the contract an asset. If such a lease were entered as an asset when no outlay is involved, the concurrent credit would necessarily be to Surplus or some proprietary account. Such a situation would be unlikely except in the case of small railroad lines and similar properties where the location of the leased property is such that it has little value for more than one enterprise. In such cases competitive bidding for the property is lacking and the service may be secured for less than its real value.

Whenever a franchise or charter granted by the state to a public utility enterprise gives to that firm monopolistic privileges, the franchise gives rise to an intangible asset. Its value depends upon the extent to which the company's earning power is increased by such exclusive privileges; and, as in the case of any similar intangible, the ascertaining of that value may be a difficult problem.

The recognition of such an intangible in the accounts is open to some objection, however, since it tends to cover up the real rate earned by the enterprise. The capitalization of excess earning power due to public favor should not be added to investment and made the basis of a claim for higher rates. Franchise values as well as developmental values are matters of significance only in connection with publicly regulated enterprises.





## **PART FIVE**

# **THE CONSTRUCTION AND ANALYSIS OF FINANCIAL STATEMENTS**



## XXV

### THE INCOME SHEET

BEFORE the accountant's work is to be regarded as in any proper sense completed, the information contained in the ledger accounts must be summarized in some statement form which will make the meaning of the accounts reasonably clear to all interested parties. Even when sound accounting principles have been followed in making book records the efforts of the accountant are often vitiated by a failure to present the information in a form intelligible to those who have no adequate knowledge of accounting. Too often, for instance, the income sheet and balance sheet are in the form of transcripts of ledger accounts prepared in the technical account form.

Much of the accountant's skill is most clearly shown in the preparation of these final statements. It is the evident function of the accountant to present this summarized information in adequate form for the guidance of the manager. It is almost as evident that it must be simple and straightforward enough for the average director to understand. It should also be added that the accountant has another type of interested party whose need for information he must satisfy, the *investor*.

There is little wonder that as he has little or no understanding of double-entry bookkeeping the average investor gives up in despair when he attempts to get enlightenment from any accountant's statement which is not both simple and unmistakably clear. The student needs but to recall his own experiences in attempting to master the intricacies of double-entry bookkeeping to realize the difficulties encountered by the average individual not equipped with this knowledge. Therefore as one of the very real functions of the accounting statement may be to furnish enlightenment to the prospective or present

investor the accountant must hold himself responsible for statements adequate to this need.

It will therefore be the purpose of Part Five to discuss the question of the proper presentation of accounting data. A knowledge of the accounting principles developed in the preceding parts will be assumed in this discussion, but the point of view taken will be that the proper presentation of accounting data must answer the needs of the person who seeks information from the accounts but who has not a training in accounting technique. From this point of view the question as to what information is of importance can scarcely be regarded apart from the other vital question as to how this essential information may best be presented.

As has been shown in previous connections, the principal types of accounting data are concerned with the historical situation as presented primarily in the income sheet and with the momentary condition on definite dates as presented in the balance sheet. There is a very close connection between these two statements but for convenience in presentation the analysis will be made in separate chapters on the basis of this classification. This chapter is concerned with the income sheet.

#### PURPOSES OF INCOME SHEETS

The data for the income sheet consist essentially of the information contained in the Expense and Revenue and Net Revenue accounts in the ledger. A rather large number of accounts are usually kept in each of these groups. A large corporation may have several hundred expense accounts and probably thirty to fifty revenue accounts as well as a dozen or more net revenue accounts. All of these accounts are for income sheet purposes but a simple list of each class such as is contained in the ten-column statement does not constitute a well organized exhibit. Such a list of accounts would be quite unintelligible to an investor and often of little use to a board of directors for outlining broad business policies. Detailed income accounts are of service for some purposes but are cumbersome for others. Too often one long income sheet including all of the accounts representing expense, revenue, and net revenue

facts is prepared to cover all possible uses. This is decidedly bad practice. It is just as much a part of the accountant's function to summarize the data in an interesting form as it is to insure that proper accounting principles have been adhered to. The same information may be presented in a variety of ways; and in many cases a series of income sheets covering the same facts should be prepared to meet the needs of different interested parties.

Among the various purposes to be served by the income sheet, probably the use of this statement by the investor is the most important. In order to judge the safety of the investment offered, the investor wishes to know the results of the past year's operations; and it is generally recognized that the values of corporation securities depend largely on earning capacity in any case. This fact of earning power should be shown in the income sheet. Stockholders have often been forced to accept the dividend rate as a basis for judging the earning capacity where income sheets either were not available or were not intelligible. This is unfortunate, for dividends do not tell the whole story. If part of the income is retained as surplus this increases the equity of the stockholder, and the probable future earning capacity, and hence makes the stock worth more than the capitalized dividends. Cases are known where stocks have been quoted on the market at as low as fifty per cent of a reasonable valuation based on earning capacity as would have been shown by an accurate income sheet. If some investors have the information and others do not it is easy to see how unfair advantage might be taken of this situation.

Closely allied to the needs of the present investor are those of the prospective investor or creditor. If a person is about to invest in the securities of a concern, he should be supplied with a readable report of the past earnings. A corporation about to float a new issue of stocks or bonds issues a prospectus showing the experience of the past and an estimate of future income. The income sheet for such a purpose should be drawn up in such a form as to show the amount of income which would have been available for that particular class of security in the past. On the basis of such a statement, the prospective buyer can reasonably judge the amount of risk involved. The price

yielded on such an issue can be materially raised on the basis of adequate information over what it would be without.

Another somewhat different type of investor should be reached with information on the income sheet. This is the speculator in corporation securities, the man who buys and sells shares for changes in the market price. Whatever may be said as to the desirableness of this type of investing, the fact remains that it is done and is countenanced by law. Further, this investor performs an economic function and should be supplied with all the information possible to perform his function efficiently. It was suggested in Chapter I that one of the chief causes for the business cycle is the inability of the business world generally to obtain reliable information with regard to past experience; and it may be added here that an adequate series of income sheets could be used as the basis for a barometer of business conditions. What the speculator needs is a periodic statement of the income available to the class of security on which he is speculating, and for him other details of income and expense are unimportant.

The board of directors is naturally more interested in the results of internal operation than are any of the various investors so far mentioned. They are more apt to ask for comparisons of gross revenues with preceding years and likewise the amount of expenses, possibly itemized by departments or functions. The members of the board should, of course, be better equipped with technical information and as more details can be digested here a fuller income sheet can be given for their purposes. Even here, however, groups of accounts are of more importance than a long list of specialized accounts. The board of directors uses the operating accounts to judge primarily as to the feasibility of continuing production, increasing the rate of production, and like questions. The net revenue items can be used to guide in a certain measure the financial policy, but whether increased investments should be made through the issue of stocks or of bonds depends on the present proportion of fixed charges (interest) to total net revenue.

The manager on the other hand requires a much more extensive analysis of the operating accounts, revenues and expenses. For his purposes a list of all revenue and all expense accounts should be prepared but net revenue items need not be so fully

stated. The more detailed the analysis of operating accounts, the better it serves for managerial purposes. It is for this purpose that the hundred or more expense accounts are kept.

Very often special occasions arise for the preparation of special reports based on the income sheet information. The government, for example, may require information with regard to costs of operation in a public service industry, or even in a competitive industry if questions of discrimination arise. Again in cases of purchase of complete properties, the consolidation of competing concerns, or the establishing of holding companies income sheets arranged in special form are essential. In fact the number and kinds of cases in which the income sheet must be used in some form are practically unlimited. The point to be made is that the ledger accounts must be analyzed and the information arranged in such a form that it will furnish direct answers to specific questions. In the following sections several different forms of income sheets will be described.

#### SUMMARY INCOME SHEETS

As was stated in the preceding section, a very brief summarized statement is perfectly adequate for the use of the average investor. It is not necessary to give all the information obtainable in a statement where but one or two significant figures would be amply sufficient. To take an extreme illustration the following would be income sheet enough for a preferred stockholder who desires to know the margin of safety for his dividend payments:

Net revenue before preferred stock	
dividends are paid . . . . .	\$500,000
Preferred stock dividends . . . . .	<u>300,000</u>
Balance . . . . .	<u>\$200,000</u>

The first item in this statement does not appear as such in any ledger account. It is found rather by deducting all prior distributions of net revenue from the total net revenue figure. Further it may be noticed that a free use of words is made to explain just what the \$500,000 item is. In an income sheet every item should be carefully explained as the use of just a ledger



account title is not sufficient for statement purposes. The information might even be written in paragraph form in order to make sure that the reader understands just what is meant.

On the basis of such a brief statement as the one given above, together with a series of like statements for preceding periods, the preferred stockholder could arrive at a fair judgment as to the risk involved in his investment. Likewise the prospective investor and speculator can use such a statement as a guide in determining what action to take. The same form of statement might be made out for each class of security outstanding for the same reason. In each case it would simply involve a different combination for the figures in the Net Revenue account.

A somewhat more detailed statement is usually desired by the investor, and surely by the board of directors, even when the brief statement is used. Question invariably arises as to the gross business done, the expenses, taxes and fixed charges at least, together with any changes in the free surplus or undivided profits. Those questions can well be answered in a very brief summarized income and surplus sheet, somewhat as follows :

Sales (gross revenue)		\$5,500,000
Expenses		<u>4,600,000</u>
Net revenue from operation		\$ 900,000
Dividends on securities owned		<u>350,000</u>
Total net revenue		\$1,250,000
Taxes		<u>50,000</u>
Net revenue to all private equities		\$1,200,000
Fixed charges (interest on bonds)		<u>700,000</u>
Net revenue to stockholders		\$ 500,000
Preferred stock dividends	\$300,000	
Common stock dividends	<u>150,000</u>	
Total dividend appropriations		<u>450,000</u>
Balance carried to surplus		\$ 50,000
Surplus on January 1st		580,000
Appreciation of land for previous years		<u>15,000</u>
Total surplus		\$ 645,000
Exceptional loss charged to surplus		<u>35,000</u>
Balance of surplus on December 31st		\$ 610,000

The meaning of each of the items in this statement is quite evident. The first item states that the sales or gross revenue for the year amounted to \$5,500,000. This, of course, is the total of all gross revenue accounts in the ledger, or may be more conveniently obtained from the total of the revenue column in a ten-column statement. The source of the second item is also obvious as this is the total of the expense column of the ten-column statement. The difference between the first two items is the net revenue from operations — the difference between the expense and revenue columns mentioned in the ten-column statement. The items down to this point constitute what is called the operating division of the income sheet. These facts concern the operations of the business as distinct from the distribution of net revenue. All gross revenue and expense items listed in an income sheet, no matter how detailed, make up the operating division.

The proportion of expenses to gross revenue is looked upon by the investor as an important figure. It is on the basis of this figure that comparisons can be made as to the risk involved as between various lines of business. The percentage figure thus obtained (expenses divided by revenues) expresses the amount of each dollar of sales consumed in operating expenses and thus a sort of norm is established for different types of business. In the manufacturing business a rather high percentage is common, eighty per cent and up almost to one hundred per cent, showing that the margin left for meeting the contractual obligations is small. A fall in the demand for product is likely to affect the investor's interests relatively soon. This does not mean that profits may not be high in proportion to investment. In fact rates of net revenue to invested capital usually do run quite high because of the frequent turnover of the stock. The fact remains that when the operating ratio is very high, the risk is also relatively high. On the other hand railroad and public utilities have a much lower operating ratio, usually from about fifty-five to seventy-five per cent. The amount of risk is not as great as changes in gross revenue would not affect the investor's claims as rapidly as if the ratio were larger. Net revenues in such cases are usually smaller in proportion to total investment because of the few turnovers possible. In the illustration given

the operating ratio is approximately eighty-five per cent. This is quite favorable for a manufacturing business.

The next group of items, from "net revenue from operation" down to "balance carried to surplus" constitutes the net revenue division of the income sheet. This is an analysis of the Net Revenue account or of the net revenue columns in the ten-column statement. First are listed the credits to net revenue. In this case, dividends on securities owned constitute the sole item of this class. Other possible items would be interest on bonds owned, appreciation of certain assets and other accruals of net revenue for the period.

Taxes are the first deduction from the total net revenue. The balance remaining constitutes net revenue available to the private equities. It has been shown earlier in the text that the proper place for the tax item is a matter of some uncertainty. Should it be considered an expense or as a distribution of net revenue? It does not come within the general class of expense items, namely, expirations of commodities and services purchased, nor is it a distribution to private equities. Inasmuch as it partakes more of the characteristics of the net revenue items than of expense, it has been placed in the net revenue group of accounts in the classifications so far presented. It is sufficiently different from other debits to Net Revenue, however, to be accorded a special place in the income sheet and this is what was done here, but the essential fact is that the amount of net revenue left for the private investors can be obtained only by making the tax deduction as a separate item. First, then, the total net revenue is obtained in the manner already shown and second the amount of this net revenue which belongs to the private investors as a whole is found by deducting the tax accruals. The tax items are the one class of expenditures which are controlled entirely from authority outside of the business organization. All expenses are incurred as the result of managerial judgments, all distributions of net revenue to private equities are the result of financial programs entered into by the board of directors. The authority for taxes comes from governmental legislative bodies. In the case of a publicly owned property, all net revenue after payments of contractual interest can be considered as in the nature of a

tax. In this case proprietary net revenue is virtually a tax on the consumer.

There are two general types of distributions to private equities, contractual deductions, usually called fixed charges, and appropriations of the proprietary net revenue. It is convenient to make the next deductions on this basis. First the fixed charges consisting of interest on bonds, amounting in the illustration to \$700,000, are deducted from net revenue accruing to the private equities, leaving the proprietary net revenue, or as it is called in this statement, "net revenue to stockholders"; and it is from this figure that the board of directors makes its appropriations. In the case given the preferred and common stock dividends constituted all of the appropriations made. Other possible appropriations, examples of which were given in Chapter XIII, would also be listed here. The financial policy of the corporation is evidenced by the proportion of fixed charges to total net revenue available to the private equities. In case the fixed charges are small in proportion to the private net revenue, the risk taken by the bondholder is light and bonds should float at a low rate of interest. On the other hand if fixed charges are high, risks are high, because of the lack of a large proprietary net revenue as a buffer, and the bonds would float at a higher rate of interest. These comparisons are of importance to all classes of investors.

There are then at least four quite distinct net revenue figures in the income sheet, (1) net revenue from operation; (2) total net revenue; (3) net revenue to private equities; and (4) proprietary net revenue. The importance of the different items varies in different types of business, and in some cases the number might be greater than four, but each of those cited is distinctive and should be shown in some form in every completed income sheet. Finally the balance of net revenue not appropriated is carried to the surplus sheet, and this completes the income sheet figures.

The surplus sheet is practically a transcript of the Surplus account in the ledger. As stated in Chapter XIII this usually represents the excess of proprietorship over the par value of stock outstanding, although there may be in some cases several accounts of this nature. In any event the Surplus account

represents the accumulated unappropriated net revenue from date of organization and as such is a connecting link between the income sheet and the balance sheet. The balance from the income sheet is carried to Surplus and the balance of the Surplus account is listed in the balance sheet. Hence in the statement of an income sheet it is customary to append a surplus sheet as the connecting item. In the first place, the previous balance in surplus as shown on the balance sheet at the beginning of the period is placed just below the income sheet item "balance carried to surplus." In the illustration given above, this item is \$580,000. Following this are listed all additions to surplus during the period, exclusive of that shown in the income sheet. The various occasions for credits to Surplus were explained in Chapter XIII. One type was shown in the illustration, an appreciation in the value of land which had accrued in previous years but was being recognized for the first time. The surplus statement takes care of all net increases in proprietorship for some previous periods. It must be emphasized again that the income sheet contains figures pertaining exclusively to a single accounting period and that all changes for other periods must be made in the surplus sheet.

The sum of the three items mentioned (balance from income sheet, balance of surplus at beginning of period, and credits to surplus during the period) makes up the total surplus. This, of course, is equal to the total credit side of the Surplus account. Next all appropriations from surplus are made. In the illustration given an exceptional loss such as results from a flood or fire was shown. Another typical case would be an appropriation of dividends either cash or stock. The surplus is a part of proprietorship and, of course, can be disposed of as the directors decide. All decreases in proprietorship for past periods which are now recognized for the first time should be deducted here. Finally the net figure is the amount carried as surplus on the balance sheet at the end of the period.

To summarize this discussion, the income and surplus sheets taken together give a complete history of operating and financial operations in so far as they have resulted in net changes in the equities for the accounting period. The income sheet deals exclusively with the accounting period and the surplus sheet is a

summary of the accumulation of surplus to date. The income sheet in turn has two distinct divisions: (1) operating, corresponding to the expense and revenue accounts, and (2) net revenue, corresponding to the net revenue accounts. The extent to which the two divisions may be itemized is entirely a matter of expediency. In the illustration given the material was summarized in very brief form but the amount of information which may be given under any heading is limited only by the degree of specialization maintained in the ledger accounts.

#### THE COMPARATIVE INCOME SHEET

While an income sheet covering one year's operations gives valuable data for financial purposes, it will readily be recognized that the facts are of much more significance when comparisons can be made with other companies conducting the same line of business or with the previous experience of the same concern. Comparisons with another concern can be made only when it is assured that both have adhered to the same accounting principles and have used essentially the same classification of accounts. The great diversity of accounting practice at the present time prevents any wide use of such comparisons, though there is an evident tendency toward greater uniformity. The Interstate Commerce Commission has standardized the classification of accounts for the railroads and other public utilities under its jurisdiction. State public utility commissions are doing the same for the utilities which they control, so that in the public utility field comparisons can very well be made between the income sheets of different companies. There have been movements by some of the manufacturing associations and retail organizations to effect the same results for industrials. The acceptance of uniform systems by individual concerns in this case is purely voluntary, however, and hence it will doubtless be some time before any very tangible results will be attained in the industrial field.

Direct comparisons can be made, however, between income sheets covering different periods for the same concern, and these comparisons are of importance to all interested parties. Of

course, if the investor saves the successive income sheets as they are published he can make the comparisons himself. But in the first place reports are not saved as a general rule even by those investors who retain possession of their securities for long periods of time. Further the constant shifting of the ownership of securities makes such information unavailable to new investors unless a comparative statement is issued each time an income sheet is prepared. Comparative figures for each item in the income sheet should be given for several years so that the investors can judge as to the normal operating condition of the concern. Some corporations make a practice of presenting a series of from two to ten annual income sheets in parallel columns, and this is a commendable practice. Even two successive income sheets are of convenience if the changes in the items are brought out clearly, perhaps in a third column showing increases and decreases. It might be well in some cases to add a considerable discussion in narrative form explaining the changes in so far as it is possible to do so. Some accountants object to placing an opinion as to the prospects of a concern on record, on the assumption that, given the same set of figures, the investor should be able to arrive at conclusions of his own. It would seem that a much more reasonable stand would be that the accountant should not only prepare the tabulated statements but should give whatever additional technical information he might be able to obtain. At least if this is not done by the accountant, some responsible officer of the concern should prepare some narrative statement based upon the income sheet.

The following is a very brief comparative income sheet together with an additional descriptive statement such as might be given to explain the changes in the figures given. The income sheets are for the X Company, a manufacturing enterprise, and cover the operations of the years 1917 and 1916. Increases and decreases are shown in the third column. Decreases are designated by the prefix *d* and no designation is given the figures representing increases.

	1917	1916	INCREASES OR DECREASES
Gross revenue	\$4,500,000	\$4,350,000	\$150,000
Expense	3,800,000	3,500,000	300,000
Net revenue from operation	\$ 700,000	\$ 850,000	(d) 150,000
Taxes	150,000	95,000	55,000
Net revenue	\$ 550,000	\$ 755,000	(d) 205,000
Interest	315,000	300,000	15,000
Net revenue for stockholders	\$ 235,000	\$ 455,000	(d) 220,000
Dividends	215,000	215,000	
Carried to surplus	\$ 20,000	\$ 240,000	(d) 229,000
Surplus Jan. 1st	1,345,000	1,230,000	115,000
	\$1,365,000	\$1,470,000	(d) 90,000
Loss on abandoned property	35,000	125,000	
Surplus Dec. 31st	\$1,330,000	\$1,345,000	(d) 15,000

Sales for the year 1917 were \$4,500,000, an increase of \$150,000 over the sales for 1916. This is due almost entirely to the fact that higher prices were charged for the products sold and not to an increased volume of business. The amount of product manufactured was very little in excess of that for last year. Expenses were \$3,800,000, an increase of \$300,000 over the same item in 1916. Large increases in wages as well as increased prices of raw materials explain this increase. The efficiency of the operatives has if anything increased during the year but not sufficiently to offset the increased wages and other prices.

Net revenue, it will be noted, was only \$700,000 as compared with \$850,000 in the previous year. Inability to raise prices of finished product as rapidly as prices of raw materials and wages advanced is the cause of this situation. The management confidently believes that prices of finished product will rise sufficiently during the next few weeks to offset the tendency shown in this figure.

Taxes were \$150,000, an increase of \$55,000 over the 1916 taxes. This, of course, is explained largely by the increased federal income and excess profits taxes for the year. There were also some increases in local taxes. The amount of net revenue left after deducting taxes was \$550,000, a decrease of \$205,000 from last year. Of course the tax policy of the government will enter largely into the question as to whether this figure can be materially increased another year.

The fixed charges, consisting of interest on bonds, increased \$15,000 to \$315,000. This increase was caused by the issue of \$300,000 second mortgage bonds, the funds being required for improvements and extensions. The regular dividend rate was maintained and a balance of \$20,000 was carried to surplus. This, it is true, is quite a narrow margin but, as was



stated above, improved operating conditions are expected in the near future through increased prices, and there is every likelihood that the regular dividends will be earned. Further, even if the earnings should turn out to be low, the surplus balance is sufficient to maintain the regular dividend payments for some time. The necessity for tapping surplus, however, is unlikely.

Such a statement as this expresses the opinion of the accountant or other official with regard to the facts represented in the comparative income sheet. An expert opinion of probable future conditions is of considerable help to the investor, especially if he is not equipped to make such judgments himself.

#### SOME SPECIAL FORMS OF INCOME SHEETS

In the preceding sections, the general divisions of the typical income sheet were described and the importance of comparative statements emphasized. This covers the general considerations with regard to income sheets. In specific cases it is desirable to emphasize certain special facts necessitating the combination of accounts in different ways. The actual form of an income sheet naturally depends on just what information it is desirable to show. It would obviously be impossible to give here an adequate description of very many forms, least of all to cover all possible cases, but a few illustrative income sheets will serve to show the extent to which the accounting information may be arranged in report form.

In a manufacturing business it is quite desirable to report the expenses incurred by the various departments so that the board of directors or at least the chief administrative officer can locate more accurately the particular department within which expenses have increased. On the basis of such knowledge, policies can be revised and improvements in operating methods suggested. A very brief statement for a manufacturing company might be as shown at top of next page.

The expenses are classified into manufacturing, selling, and administration groups, the first two corresponding to the departments controlled by the factory manager and the sales manager and the third representing the general office expenses which are

Sales of product		\$5,057,569
Manufacturing expenses	\$4,092,686	
Selling expenses	509,385	
Administration expenses	110,250	
Total expenses		4,712,321
Net operating revenue		\$ 345,248
Taxes		21,350
Net revenue		\$ 323,898
Interest on 1st m'tg. bonds	\$ 125,200	
Interest on 2nd m'tg. bonds	35,185	
Interest on equipment notes	18,395	
Total fixed charges		178,780
Net revenue to stockholders		\$ 145,118
Sinking fund contribution	\$ 25,200	
Dividends	85,300	
Total appropriations		110,500
Balance carried to surplus		\$ 34,618

not conveniently chargeable to either department. It may be said that to a certain extent the factory manager is responsible for the expenses incurred in the process of manufacturing. He makes certain judgments as to the methods to be adopted in production and as a result incurs the manufacturing expense. He should be called upon to explain changes in the total manufacturing expenses between various periods. Particularly should changes in the ratio of these expenses to the gross sales be explained. This does not mean that this ratio in any sense measures the efficiency of the factory manager. He cannot control the price of labor nor of the materials which must necessarily be purchased, and hence an increase in the cost of these items does not reflect upon the ability of the manager to produce on an efficient basis. In other words, the manager should be able to explain the changes in manufacturing expenses but should not be held entirely responsible for the same.

Questions regarding the changes in selling expenses from period to period should be referred to the sales manager in a like manner. This item includes all expenses incurred by the selling organization, such as salesmen's salaries, advertising, and depreciation of selling equipment. The ratio of these expenses to the gross sales is usually followed quite closely from period to period and in many lines of business reaches a fairly normal standard. In

certain lines of manufacturing it is as low as five per cent while in others it amounts to more than the manufacturing expense. In the retail business practically all of the expenses incurred (aside from the purchase price of the goods sold) come under this head and amount to from fifteen per cent to as high as thirty-five per cent of the gross sales. In place of manufacturing expenses in such a statement, the purchase price of merchandise sold is listed in the income sheet.

The administrative expense items include all of that group of expenses which cannot be apportioned to either the manufacturing or the selling departments, such as the general officers' salaries, legal and accounting expenses, and the like. Sometimes an arbitrary method of apportioning these expenses to the manufacturing and selling departments is employed and in this case no administrative expense item appears in the income sheet. The salary of the president, for example, is charged partly to manufacturing expense, and partly to selling expense. The apportionment is supposed to represent the relative cost of his services to the two departments. It can be seen that such an apportionment must at best be very arbitrary. Further it is doubtful if this adds to the usefulness of the expense accounts. In fact, combining such unlike items in the same expense account seems to confuse rather than aid in the interpretation of the statements. The administrative officers perform as separate and distinct a function as do the factory superintendent and sales manager, and it would be well to keep administrative expenses in separate accounts. In a functional classification at least administrative and general expenses should be clearly separated from the other departmental expenses.

Taxes surely cannot be charged against the expense accounts of a department nor to the general expense since, as has been shown before, these constitute a deduction from net revenue. It might be well, however, to keep a separate account for the different kinds of taxes paid, that is, one for federal, one for state, one for local, etc. This would be of some importance to the management in making comparisons with the normal taxes in other localities. The remaining items in the above illustration are contractual distributions and proprietary appropriations and these were discussed fully in the preceding section.

In the illustration just given gross revenue was stated in one item — sales. This would cover the situation for a plant manufacturing one homogeneous product, or even one which makes one main product together with several by-products. If more than one class of product is manufactured, however, it would be advisable to keep a separate sales account for each class and to list each separately on the income sheet. Thus a plant manufacturing rubber goods might have a list of gross revenue items like this :

Sales of auto tires	\$795,200
Sales of rubber boots	195,300
Sales of plumber's rubber goods	100,500
Sales of rubber mats	75,400
Sales of miscellaneous rubber goods	<u>25,800</u>
Total gross sales	\$1,192,200

This gives an impression of the volume of business done in the different lines. This does not, however, give an idea as to the profitableness of the different lines. The expenses are still listed on a functional basis. The manufacturing, selling, and administrative expenses are listed in totals and have not been apportioned to the separate kinds of goods manufactured. If all of the goods are manufactured with essentially the same equipment, buildings, machines, supplies, labor, etc., it would be quite impossible to separate the expenses to show the cost of manufacturing and selling the different products. It is true that systems of cost accounts are used to apportion on a more or less arbitrary basis the expenses to the different products produced, and that statistics thus obtained from the cost accounts are of considerable importance to the manager ; but such details would have little significance if carried to the income sheet. These facts would be used primarily by the manager to determine roughly the relative costs of producing the different products as compared with the prices obtained from the sale of the same ; and such information will determine to a certain extent the lines of goods to be produced. In reporting expenses in the income sheet, however, the functional classification should be followed. Arbitrariness should be excluded from financial statements as far as possible. The important thing to show for income sheet purposes is the total of each class of expenses.

There are certain cases, however, in which it is advisable to show expenses according to products or service performed. A corporation, for example, may operate entirely distinct plants each producing a separate product. In such a case the functional classification can be used for each of the plants the same as though the operations were carried on by separate corporations. The public utility industry affords a typical illustration of this form of organization. Frequently several forms of public service, such as the supplying of gas and electricity, are produced by the same corporation. A separate organization is maintained for each of the plants and it is both convenient and advisable to keep separate classifications of operating accounts for each of the different properties. In this case there would be little occasion for the use of an arbitrary apportionment of expenses. The administrative expenses would have to be divided, but any other expense would for the most part pertain exclusively to one of the plants. The following is an illustration of an income sheet for a corporation operating both an electric and a gas business.

Gross revenue — gas	\$246,300	
Operating expense — gas	<u>147,600</u>	
Net revenue — gas		\$ 98,700
Gross revenue — electric	\$385,600	
Operating expense — electric	<u>225,300</u>	
Net revenue — electric		<u>160,300</u>
Net revenue — gas and electric		\$259,000
Taxes		<u>15,185</u>
Net revenue to private equities		\$243,815
Interest on bonds		<u>138,325</u>
Net revenue available to stockholders		\$105,490
Sinking fund installment	\$ 12,200	
Dividends declared	<u>75,000</u>	
Total appropriations		<u>87,200</u>
Balance carried to surplus		\$ 18,290

The separating of the different businesses as was done above is of interest to the investor. The amount invested in each of the properties may be shown on the balance sheet. The net revenue for each type of service as shown by the income sheet divided by the investment shows the rate of return from each of the different

properties, and incidentally can be used to gauge the risk involved. Likewise the public official having the task of regulating rates is interested in having the income sheet prepared in this form. It is often considered poor public policy to allow the revenue from one service to cover the expenses of another. If the gas business shows a net loss instead of a net revenue, for example, while the electric plant made a large enough net revenue to yield a reasonable return on the entire investment, the customers of the electric department might be said to be paying partly for the bills of the customers of the gas department. This may or may not be a good policy, but whether it is or not, the income sheet drawn up in the above form shows the true situation. With such a statement as a basis, judgments can be made as to general rate policies.

This form of income sheet would be of service wherever different businesses are carried on under one organization. Sometimes a corporation which is primarily engaged in a manufacturing business, for example, operates a real estate business in addition. An income sheet such as the one just described would show the operating results of the two businesses separately.

#### FURTHER CLASSIFICATION OF OPERATING ACCOUNTS

The income sheets shown in the preceding illustration have all been for general purposes — for the investor, the board of directors, and the general administrative officer alike. For such general purposes details are undesirable and hence the income sheets presented were summarized in rather compact form. It is better to give a little information in understandable form than to give a great deal in complex form. The investor is primarily interested in net revenue and its distribution, hence the net revenue division is of most importance and is itemized more fully. On the other hand the manager desires a rather detailed list of operating accounts. What were the gross sales of each of the different kinds of products sold, and what was the expense incurred for each separate function performed? These are the questions asked by the manager, and classifications of operating accounts are of use in answering these questions.

It is a relatively simple matter to keep a rather extensive

classification of revenue accounts. The entries to the credit of gross revenue accounts are made only as a result of formal sale transactions and a separate sales account may be kept for every kind of commodity sold. These might be very few in number or may run into the hundreds; but no technical difficulties arise.

The expense classification is more complicated, however. The difficulty here arises from the fact that a complex equipment together with various forms of services enter into the producing of a single product. Fixed assets, current assets, and labor services are all used together to produce the product of a period. The expense incurred through the use of fixed assets consists of depreciation and of repair costs as was explained in Chapter XXII. The repair costs may be incurred through the purchase of new parts and the use of certain labor services to make the adjustments, or through the use of supplies on hand, together with labor services, or the whole job might be contracted for with outside parties. The expense character of the repair job is evident regardless of how accomplished, but if the manager desires a statement of repair costs as distinct from other expenses, this may be a difficult matter.

This complexity in the use of supplies and services is present in practically every type of expense which might be mentioned. What then should be the basis for the classification of expense items? Raw materials in the case of a manufacturing industry can usually be set down without difficulty as one significant account. The cost of materials purchased and placed in the manufacturing process also constitutes one distinct type of manufacturing expense which is easily segregated and may be used for managerial purposes. The next item which logically presents itself is the cost of labor and the total wages paid may be ascertained from the payroll vouchers; but it does not follow that the labor expense should be taken as one expense account. In most cases very little use could be made of a statement showing simply total labor expense, as what is desired is an exhibit which shows the different purposes for which labor is used. As was shown in the preceding paragraph, part is used for repair work to fixed assets and part is used directly on manufacturing operations. A classification of labor charges for

purposes of the management is necessary. The same thing may be said of supplies and in fact of all items which are used indiscriminately for various purposes; for it is essential finally to charge each item to an expense account representing the function for which it is used.

This simply means that a measurement of the separate asset items consumed does not constitute in all cases a complete classification of expense accounts which is adequate for managerial purposes. What does constitute an adequate classification depends on the needs of the individual manager. It is quite generally recognized that a functional classification is most desirable, and therefore a list of the various functions necessary to the production of the commodity or service should be drawn up and then one expense account kept for each function. This necessitates a considerable use of internal accounting entries. Purchases are first charged to sundry asset accounts and then as the items are used charges are made to the proper expense accounts. The extent to which such a policy should be carried is a question of expediency, and the controlling consideration is the use to which the resulting information may be put by the manager.

Enough has been said to show the difficulties confronting one in outlining an expense classification. The following will serve to illustrate what might cover the situation for the manufacturing concern whose income sheet was shown on page 559.

*Manufacturing Expenses —*

Materials		\$1,895,365
Direct labor		825,200
Maintenance of factory building —		
Repairs	\$165,300	
Depreciation	<u>65,495</u>	230,795
Maintenance of factory equipment —		
Repairs	\$215,350	
Depreciation	<u>195,400</u>	410,750
Power expenses —		
Fuel	\$185,400	
Labor	10,250	
Repairs to power plant	8,175	
Depreciation of power plant	<u>95,300</u>	299,125



Tools, patterns and dies used		\$ 485,300
Supervision —		
Salaries of factory officials	\$25,400	
Office supplies	2,300	
Maintenance of office equipment	<u>1,895</u>	29,595
Miscellaneous factory expenses		<u>18,418</u>
Total expenses incurred during year		\$4,194,548
Inventory finished goods and goods in process Jan. 1st		<u>985,400</u>
		\$5,179,948
Inventory December 31st		<u>1,087,262</u>
Manufacturing cost of goods sold per income sheet		\$4,092,686
<i>Selling Expenses —</i>		
Salaries		\$221,315
Advertising		205,420
Maintenance of sales offices —		
Repairs	\$5,200	
Depreciation	<u>4,395</u>	9,595
Travelling expenses		25,875
Entertainment of customers		15,215
Office expenses		25,400
Miscellaneous selling expenses		<u>6,565</u>
Total selling expenses per income sheet		\$509,385
<i>Administrative Expenses —</i>		
Salaries of officials		\$70,530
General office expenses		25,320
Maintenance of general office equipment —		
Repairs	\$5,200	
Depreciation	<u>2,185</u>	7,385
Miscellaneous general office expenses		<u>7,015</u>
Total administrative expenses per income sheet		<u>\$110,250</u>

This shows in rather brief form the type of information desired by the general manager. Each account supposedly represents one class of expense items about which questions of management are involved. Comparisons can be made between

the various items on successive statements, and if several plants are operated by one concern, between the various operating units. The important point to emphasize is that the schedule of operating accounts is drawn up by or at least for the manager.

#### THE CONSOLIDATED INCOME SHEET

The viewpoint taken in discussing the preparation of the accounting statements as well as in the discussions of accounting principles has been that of the business enterprise. This is largely a legal concept and while it is fundamental in accounting records for certain types of business organizations it is of less importance in reporting financial statistics than is the concept of a complete *operating* unit. The holding company form of organization, for example, is a method commonly used in modern corporation finance to combine several legally separate and distinct corporations under one operating organization through stock ownership. Each company retains its corporate existence and hence a complete set of accounts is maintained for each enterprise, but such effective control is exercised over the operations of the group by the corporation holding the capital stock that all of the companies may be looked upon as one organization. Large railroad systems have been built up as a result of one company purchasing the majority interest in the capital stock issues of many small companies. The same tendency has been evidenced in industrial concerns such as the steel industry. In fact wherever economies may be effected or monopolistic conditions attained this form of combination has been resorted to.

Since the accounts are of the individual concerns, such combinations in no way affect the fundamental accounting practices. The accounts of the separate corporations are kept in the same way after as before the establishing of the holding company. For the purposes of the investor in the holding company, however, it is desirable to make an income sheet for the operating organization. This shows the revenues and expenses of all the concerns as a whole. On the basis of such a statement the investor can judge as to the effectiveness of the holding company form of combination. Likewise the manager desires exhibits of operating accounts as of the whole system for administrative purposes.

The preparation of such statements is a relatively simple matter, however, as it is only necessary to add up the items of like character in the income sheets of the separate companies to produce what is called a consolidated income sheet.

An illustration will serve to show how such a statement may be used by the investor and manager. Suppose that the A Company, besides operating a manufacturing business, owns over fifty per cent of the stock of the B, C and D companies, each of which is engaged in the same or a like business, and that the following represents the income sheets of each of the companies in summary form :

<i>A Company</i>		
Gross revenue		\$1,250,000
Expenses —		
Manufacturing	\$725,300	
Selling	115,250	
Administrative	<u>95,400</u>	<u>935,950</u>
Operating net revenue		\$ 314,050
Dividends from stock of B, C, and D owned		425,300
Interest on investments		<u>5,825</u>
Total net revenue		\$ 745,175
Taxes		<u>10,145</u>
Net revenue to private equities		\$ 735,030
Interest on bonds		<u>385,205</u>
Net revenue available to stockholders		\$ 349,735
Dividends declared		<u>285,300</u>
Balance carried to surplus		\$ 64,435

<i>B Company</i>		
Gross revenue		\$ 625,400
Expenses —		
Manufacturing	\$318,250	
Selling	85,200	
Administrative	<u>9,800</u>	<u>413,250</u>
Operating net revenue		\$ 212,150
Taxes		<u>5,450</u>
Net revenue to private equities		\$ 206,700
Interest on bonds		<u>95,215</u>
Net revenue available to stockholders		\$ 111,485
Dividends —		
Amount on A's holdings	\$95,300	
Other stockholders	<u>5,700</u>	<u>101,000</u>
Balance carried to surplus		\$ 10,485

# THE INCOME SHEET

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## C Company

Gross revenue		\$2,175,300
Expenses —		
Manufacturing	\$1,250,000	
Selling	375,200	
Administrative	<u>110,100</u>	<u>1,735,300</u>
Operating net revenue		\$ 440,000
Taxes		<u>25,200</u>
Net revenue to private equities		\$ 414,800
Interest on bonds		<u>15,300</u>
Net revenue available to stockholders		\$ 399,500
Dividends —		
Amount on A's holdings	\$ 275,400	
Other stockholders	<u>65,300</u>	<u>\$ 340,700</u>
Balance carried to surplus		\$ 58,800

## D Company

Gross revenue		\$ 450,375
Expenses —		
Manufacturing	\$ 185,325	
Selling	17,415	
Administrative	<u>8,310</u>	<u>211,050</u>
Operating net revenue		\$ 239,325
Taxes		<u>6,480</u>
Net revenue to private equities		\$ 232,845
Interest on bonds		<u>78,310</u>
Net revenue available to stockholders		\$ 154,535
Dividends —		
Amount on A's holdings	\$ 54,600	
Other stockholders	<u>42,400</u>	<u>97,000</u>
Balance carried to surplus		\$ 57,535

A consolidated income sheet showing the operating results of the combined properties would be as follows :

*Consolidated Income Sheet*

## A Company and Its Subsidiaries

Gross revenue		\$4,501,075
Expenses —		
Manufacturing	\$2,478,875	
Selling	593,065	
Administrative	<u>223,610</u>	<u>3,295,550</u>
Operating net revenue		\$1,205,525
Interest on investments		<u>5,825</u>
Total net revenue		\$1,211,350
Taxes		<u>47,275</u>
Net revenue to private equities		\$1,164,075
Interest on bonds		<u>574,120</u>
Net revenue available to stockholders		\$ 589,955
Dividends on stock in hands of public		<u>398,700</u>
Balance carried to surplus		\$ 191,255

This shows the income sheet as it would look if the various properties were legally consolidated into one corporation. There are few questions of principle involved. Attention should be called to the fact that inter-company relations in so far as possible have been eliminated. The dividends earned as shown on the income sheet of the A Company were also shown as distributions on the subsidiary companies' income sheets. Hence, in consolidating the statements these items were omitted altogether. If they had been included it would be an operation similar to transferring funds from one pocket to another. The same situation would probably arise in connection with the purchase and sale of products between the various companies. Company C, for example, might be purchasing products from B Company at a price high enough to yield a profit. The part of such profit which accrues on the stock held by the A Company is both an expense and a revenue in the consolidated income sheet. There is some justification, however, for not attempting to eliminate this element. Not only would it be extremely difficult to determine the amount involved, but the correction is automatically made in the operating division, leaving operating net revenue at just the figure it would be if the profit on such inter-company sales were eliminated. The consolidated income sheet can be

analyzed for the purposes of the various interested parties in much the same way as the ordinary income sheet of one business concern.

This chapter may be briefly summarized. The historical data furnished by the expense, revenue, and net revenue accounts can be placed in statement form in any number of different ways for the purpose of bringing out clearly different kinds of information. In some cases it will be in compact, brief form, in others considerable detail is included. The accountant first determines the information desired and then presents the same in such form that it can readily be understood. A large part of the practicing accountant's work consists in compiling classifications of accounts. A few typical classifications were shown in the illustrations, not with an idea of presenting a complete system to be adopted in any one business enterprise, but rather to suggest the essential considerations in connection with the drawing up of a system for any concern.

The surplus sheet, which is usually appended to the income sheet, represents the changes in the more permanent proprietary accounts. This statement shows the accumulated net revenue from date of organization and the balance appears on the credit side of the balance sheet, while the income sheet includes only the current changes in equities for the accounting period. The next chapter will be concerned with the form and content of the balance sheet.

## XXVI

### THE GENERAL BALANCE SHEET

THE balance sheet is the foundation of the accounting structure, as was shown in an early chapter, and it has therefore been necessary to refer repeatedly to this statement as a basis for discussions of principle. The general nature of the balance sheet and the type of information conveyed should now be thoroughly understood, but it still remains to discuss the arrangement and form of presentation in much the same manner as was done in the preceding chapter for the income sheet.

#### GENERAL BALANCE SHEET CAPTIONS

The main purpose of the balance sheet is to present a statement of the financial condition of a business enterprise at a stated date. For this purpose a simple list of assets on the one side, and of equities on the other, would be sufficient. But many other rather important questions can be answered by a judicious arrangement of items into groups, each representing a separate class of assets or equities. The importance of distinguishing between fixed and current assets in a balance sheet has already been sufficiently emphasized, and in Chapter IX a classification of accounts under each group was shown. In making out balance sheet reports for the purposes of the various interested parties the items shown in the ledger accounts may be combined in any number of different ways in order to bring out different kinds of information. For instance, the different items entered in the asset column of the ten-column statement can be shown under very few heads when transferred to a regular balance sheet. It is good policy, however, to explain carefully

the nature of each item placed in the balance sheet even at the risk of using a considerable number of words.

In general, the nature of fixed assets is clearly understood. All property items of a permanent character are included in this class, though the test of permanency is a matter of judgment. Usually if the item lasts for more than one year from date of purchase it is considered a fixed asset, although certain types of assets which are retained for much longer periods are commonly placed among the current assets. In any case, it is assumed that the fixed assets represent the more permanent forms of investment made by the long-term security holders.

In making up a balance sheet, all fixed assets may be put into one figure for certain purposes. Usually, however, it is much better to state definitely the amount representing fixed tangible assets under one head, fixed intangibles under another, and securities held for investment purposes under a third. These are three significant classes of fixed assets and even in the most abridged balance sheets should be shown separately. In thus separating these items, the balance sheet states that a certain amount of the capital investment is in the form of physical property, a certain amount in intangibles — such as goodwill, and finally a certain amount in the securities of other corporations. If an income sheet is available, it is possible to determine with a reasonable degree of accuracy the propriety of the valuations made. Net revenue from operation divided by the total valuation of tangible and intangible assets should give a percentage figure at least equal to the normal rate for the type of business involved. In case it is less than this, the valuation of the intangibles is excessive. The extent of the over-valuation can clearly be seen if the two types of assets are shown under separate headings. This is the legitimate objection to using such a general caption as plant, machinery, land, goodwill, patents, etc., to cover the fixed assets. So also the separate statement of the net revenue from investments will show whether the valuations placed on investments are justifiable.

The first classification of balance sheet headings under fixed assets then should be on the basis of, (1) physical property, (2) intangible assets, and (3) long-term claims. Each of these groups may be subdivided in more extensive balance sheets as



need arises. Thus, tangible assets may be divided into buildings, land, machinery, and other equipment. Such a classification serves to show the relative importance of the different kinds of fixed physical property used. Each of these classes should be divided in much more detail for the purposes of the management. This is a functional classification.

Another basis for classification of fixed assets would be the kinds of business done. Thus in the case of a company which furnishes both electric and gas service to a community it would be well to list among the fixed assets :

Physical equipment — electric . . . . .	XXXX
Physical equipment — gas . . . . .	XXXX

Then if the income sheet is also classified on this basis, the rate of return on each form of property is available. In this case a functional classification for each plant should be available for managerial purposes.

An important consideration to be observed in classifying the balance sheet accounts is to follow as far as possible the corresponding income sheet divisions, so that judgments as to the effective use of particular items of the investment can conveniently be made.

Current assets consist of all the property items which are currently consumed or are of a liquid character. It is generally a poor policy to list all current items in one figure on the balance sheet. Certain current items such as accounts, notes receivable, and cash, are quite liquid and may be used to meet the current liabilities. These constitute one class which should be listed separately. Then raw materials and other working assets which are not as liquid should be listed in another group. It is good finance to raise practically all the funds needed for the current liquid assets through short-term current liabilities. Hence a comparison between these items is of importance. On the other hand, the working assets which remain somewhat longer in the business process should be obtained through more permanent liability obligations. A third class of current assets closely resembling the working assets are the unexpired claims for services, such as insurance premiums, unexpired advertising, etc. It is well to place these in a special group.

A final class of items on the asset side consists of valuation items. This includes items which cannot be considered as true assets, such as exceptional losses not yet charged off, and expenses which have been incurred but have not been recognized in expense accounts. In this group will also be placed the valuation accounts such as Discount on Stock and any other formal deficit, if one exists.

The classification of equity items is somewhat similar to that of the assets. In the first place the permanent equities, represented by stocks and bonds outstanding, are listed as fixed capital. These usually are nearly equal in amount to the fixed assets.

The current liabilities consist of all the short-term claims. It is good policy to classify these items into those which must be met practically on demand, such as notes and accounts payable, and those which accrue over a relatively long period, such as accrued interest and taxes.

A third class of accounts appearing on the equity side of the balance sheet consists of the deferred credit items. These are usually in the nature of suspense accounts. Examples of deferred credits have been given in a preceding chapter. A typical case is the unredeemed coupon account in the case of a company which sells coupon books in advance of performing the service for its customers. In one sense the unredeemed coupons may be called liabilities to the holders. Credits are made to revenue during the periods in which the coupons are presented for service, and the concurrent charges are made to the liability account. The valuation accounts, such as allowances for uncollectible accounts and for depreciation, should be set off in a separate group. In some cases it would be proper to show the valuation items as deductions from the specific asset items on the other side of the balance sheet. In the next section the two ways of treating valuation items will be shown.

The last class of items on the equity side consists of surplus and proprietary reserves, and these are added to the capital stock item to determine total proprietorship.

Briefly the general balance sheet captions can be stated in outline form as follows :

## ASSETS

## Fixed :

- Tangible
- Intangible
- Long-term claims

## Current :

- Liquid
- Working
- Sundry
- Deferred debits
- Valuation items
- Deficit

## EQUITIES

## Fixed :

- Capital stock (proprietary)
- Bonds (liability)

## Current :

- Notes and accounts
- Accrued items
- Deferred credits
- Valuation items
- Surplus and proprietary reserves

Further subdivisions of groups may be made in case further details are desired. The classification given here is fundamental, however, for any type of balance sheet.

## ILLUSTRATIVE BALANCE SHEETS

The form in which the balance sheet information should be presented depends on the particular phase of the business condition which it is desired to emphasize. There are many different forms quite generally used in actual practice. In fact it might be well to prepare a series of balance sheets for the same concern, giving the same information in different ways. In one case the ultimate solvency as reflected by a comparison of fixed assets and fixed capital might be the most important fact to be disclosed. In such a case, these items will be placed first on their respective sides of the balance sheet. Immediate sol-

vency, as reflected in the comparison of current liquid assets with current liabilities, being of secondary importance, might be shown by a second grouping. The deferred debit items and valuation accounts would complete the asset side, while deferred credit items and valuation items followed by surplus and proprietary reserves would complete the credit side. This form of statement has been quite widely adopted and may be found in many of the current published records of corporations. On the other hand it may be felt that for certain purposes, immediate solvency conditions should be shown first on the balance sheet. In this case the order of the items would be just the reverse of that stated in the preceding case.

The following is an illustration of a balance sheet arranged according to the first plan mentioned:

## ASSETS

## Fixed :

Plant, machinery, equipment	\$2,498,794	
Patents, trademarks, designs	587,385	
Securities of subsidiaries	<u>1,385,476</u>	
		\$4,471,655

## Current Working :

Material inventory	\$ 485,395	
Inventory of goods in process including proportion of labor and indirect expenses	325,400	
Inventory of finished goods	<u>586,500</u>	
		1,397,295

## Current Liquid :

Notes receivable	\$ 675,300	
Accounts receivable	276,400	
Cash	125,375	
Short-term investments	<u>215,486</u>	
		1,292,561

## Deferred Debits :

Prepaid rentals	\$ 35,400	
Unexpired insurance, etc.	<u>15,875</u>	
		51,275

## Valuation Items :

Discount on bonds		<u>215,325</u>
		<u><u>\$7,428,111</u></u>

## EQUITIES

<b>Fixed Capital:</b>		
Preferred stock	\$ 525,000	
Common stock	1,500,000	
Bonds	<u>1,500,000</u>	\$3,525,000
<b>Current Liabilities:</b>		
Notes payable	\$ 975,300	
Accounts payable	585,400	
Accrued wages	10,350	
Taxes accrued	8,400	
Interest accrued	<u>4,875</u>	1,584,325
<b>Deferred Credits:</b>		
Prepaid rentals	\$ 5,875	
Unredeemed coupons	<u>10,485</u>	16,360
<b>Valuation Items:</b>		
Allowance for depreciation	\$ 655,750	
Allowance for doubtful accounts	<u>45,875</u>	701,625
<b>Surplus and Proprietary Reserves:</b>		
Sinking fund reserve	\$ 185,400	
Reserve for contingencies	575,300	
Surplus	<u>840,101</u>	1,600,801
		<u><u>\$7,428,111</u></u>

The fixed assets are placed opposite capital liabilities, in order that comparisons between these two classes of items may be readily made. In this illustration the former exceed the latter by a considerable amount indicating, in case conservative valuations have been made, that the ultimate solvency of the concern is unquestionable. A comparison of the current liquid assets with the current liabilities reveals the fact that there may be some concern as to the immediate solvency. Current liabilities are considerably in excess of these current assets. Such comparisons as these, while not conclusive, indicate in a general way the

condition of the concern. The comparison between current assets and liabilities is of especial interest to bankers and other short-term creditors. As has been shown in previous connections, a large part of the circulating capital of a concern is raised through the use of bank credit. Such comparisons as the one last considered can be made the basis of a reasonable decision in regard to the granting of loans by banks.

The ultimate solvency as revealed in the first comparison is of particular interest to the bondholders. The possibility of loss of capital in case of foreclosure is shown in a comparison of the fixed assets and capital. Of course the bondholder is also interested in immediate solvency as the probability of receiving interest installments is determined by this condition.

The next group of items on the asset side consists of accounts representing rights to services which are unexpired. These are placed under the general heading "deferred debit items." A discussion of these items was given in Chapter X. These are items held in suspense. If not large in comparison with the total assets these will not influence materially judgments as to either immediate or ultimate solvency.

Finally the debit valuation accounts complete the asset side of the balance sheet. In this case, discount on bonds is the only item included in this group. This, as has already been shown, is an offset to the bond account in which bonds are listed at par.

On the equity side, the deferred credit items consist of prepaid rentals and unredeemed coupons in this illustration. These again, since they are not large in amount, will not seriously affect the conclusion drawn with respect to the general condition. The credit valuation items are offsets to certain asset accounts. The allowance for depreciation should be considered in connection with the various fixed assets in determining the valuations which have been set upon these items by the officers of the company.

There is considerable force in the argument that valuation accounts should be deducted from the accounts affected directly rather than placed upon the opposite side of the balance sheet. It might be better, for example, to list the fixed assets as shown in the balance sheet above and to deduct "allowance for de-

preciation," carrying the balance as the present value of **fixed assets**. *It can be readily seen that this would give a much more significant figure to compare with the fixed capital items.* At least it would save making an arithmetical computation before making such a comparison. Another reason for deducting valuation accounts from the main account is to show specifically the nature of the valuation accounts. Very frequently such an account, instead of being called "Allowance for Depreciation" is called "Reserve for Depreciation." It is but natural that the individual who is unfamiliar with accounting technique should **confuse** these accounts with surplus reserves or even with funds. If placed on the asset side as deductions, such confusion is less likely.

The last group of accounts shown here are the surplus and proprietary reserves. These show the additions which must be made to capital stock in order to determine the total proprietorship. The fact that several proprietary reserves are shown here should not confuse the person reading the balance sheet. All these items are proprietary accounts and, as carried in total, should be definitely called "surplus." This item is of particular interest to the stockholder but is of some importance to the bondholder. The account acts as a buffer for the claims of all permanent security holders.

Balance sheets might in some cases be separated into distinct parts in order to bring out clearly the comparison which it is desired to make. The distinction between immediate and ultimate solvency, for example, which has been mentioned frequently, might be shown by two balance sheets, (1) the "current account" balance sheet and (2) the "capital account" balance sheet. The current account statement would show the conditions with respect to the short-term creditors, while the capital account balance sheet would show the condition of the permanent investment. On pages 581 and 582 are shown illustrations of current and capital account balance sheets respectively for the company whose balance sheet was shown in the preceding illustration.

The current account balance sheet here shows that there is an excess of current liquid and working assets over current liabilities. This is called the current surplus. This is significant in showing the relation between the assets which can be con-

# THE GENERAL BALANCE SHEET

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## *Current Account Balance Sheet*

### Current Liquid Assets :

Notes receivable	\$ 675,300
Accounts receivable	276,400
Cash	125,375
Short-term investments	215,486
	<u>\$1,292,561</u>
Less allowance for doubtful accts.	<u>45,875</u>

**\$1,246,686**

### Current Working Assets :

Material inventory	\$ 485,395
Inventory goods in process	325,400
Inventory finished goods	<u>586,500</u>

**1,397,295**

### Deferred Debits :

Prepaid rentals	\$ 35,400
Unexpired insurance, etc.	<u>15,875</u>

51,275

**\$2,695,256**

### Current Liabilities :

Notes payable	\$ 975,300
Accounts payable	585,400
Accrued wages	10,350
Taxes accrued	8,400
Interest accrued	<u>4,875</u>

**\$1,584,325**

### Deferred Credits :

Prepaid rentals	\$ 5,875
Unredeemed coupons	<u>10,485</u>

**16,360**

### Current Surplus

**1,094,571**

**\$2,695,256**

## *Capital Account Balance Sheet*

### Fixed Assets :

Plant, machinery and equipment	\$2,408,794
Patents, trademarks, designs	587,385
Securities of subsidiaries	<u>1,385,476</u>
	<u>\$4,471,655</u>
Less allowance for depreciation	<u>655,750</u>

**\$3,815,905**



**Fixed Capital:**

Preferred stock		\$ 525,000	
Common stock		1,500,000	
Bonds	\$1,500,000		
Less discount	<u>215,325</u>	<u>1,284,675</u>	
			\$3,309,675
Capital Surplus			<u>506,230</u>
			<u>\$3,815,905</u>
Current surplus		\$1,094,571	
Capital surplus		<u>506,230</u>	
Total surplus		<u>\$1,600,801</u>	

verted into cash through sale within a relatively short time, and the liabilities which must be met within a like period. Such a statement would be of particular importance to a banker at the time a request is being made for a commercial loan. If the banker is presented with an income sheet showing the earning conditions, and a current balance sheet showing immediate solvency conditions, he is in a position to arrive at a reasonable conclusion as to the propriety of extending a loan. Some bankers' associations have advocated special forms of reports for this purpose and on each of these provision is made for making just such comparisons as this one. Not only is this important for the banker's purposes, however, but the manager also should have just such statistics available for determining the feasibility of increasing the current working assets through short-term credit or through floating additional securities. The amount of current capital which should be supplied by the long-term investor as compared with the short-term credit is always a difficult matter to determine, and such a balance sheet as this would aid in solving this question.

The second of these balance sheets shows the relation between the fixed assets and the permanent capital. The capital surplus item represents the excess of the former over the latter. A healthy condition relative to ultimate solvency is shown when the capital surplus is large in amount. Each one of the security holders is able to determine from such a statement the margin of safety for his capital investment. All of the stockholders' equity plus the capital surplus must be consumed, for example, before the bondholders' is touched. A capital account balance

sheet could very well be used for prospectus purposes at the time of issuing new securities. It would be of little use alone, however, without the current balance sheet, as the stockholders' equities suffer before even the current liabilities. In the illustration the fact that a surplus is shown in both the current and capital account balance sheets indicates a healthy solvency condition.

The sum of the surplus items as shown in the two balance sheets constitutes the total corporate surplus. A considerable use is made of current and capital account balance sheets for corporations in England, but in this country its use has been restricted mainly to the balance sheets of municipalities.

It is often difficult to determine the proprietor's equity in the case of a corporation, especially when several surplus and proprietary reserves are used. The proprietor's equity is made up from the accounts showing (1) capital stock, (2) surplus and proprietary reserves, (3) operating deficit, and (4) discounts and premiums on capital stock. The equities of all the other investors and creditors are shown in fewer accounts. The equity of the bondholder, for example, is shown in the bond and discount or premium accounts, except of course the accrued interest which would be entered in another account. In order to bring out clearly the amount of the proprietorship in the enterprise, it is often desirable to rearrange the balance sheet in some other form. The following is a copy of a balance sheet of a well-known rubber company, which was sent out for advertising a new issue of preferred stock. A series of about ten balance sheets in this form was given in parallel columns for comparative purposes, but only the one for 1917 is shown here. (See top of next page.)

It will be noticed that the company first emphasized the total assets and next the total liabilities. The total liabilities were then deducted from the total assets and the balance was designated "excess of assets over liabilities." The point which it was desired to emphasize was the fact that the proprietor's equity was approximately three times as large as the outstanding liabilities. In the appended statement the proprietor's equity is subdivided according to the amounts shown in separate ledger accounts. Part of this equity is represented in preferred stock

## PRINCIPLES OF ACCOUNTING

## BALANCE SHEET, X RUBBER COMPANY

October 31st, 1917

<b>Assets :</b>	
Plant and equipment	\$24,942,790.23
Quick assets	51,053,655.93
Other assets	<u>6,566,145.38</u>
Total assets	\$82,562,591.54
<b>Liabilities :</b>	
Bonds	None
Other liabilities	<u>21,126,529.26</u>
Total liabilities	\$21,126,529.26
Excess of assets over liabilities	<u>\$61,436,062.28</u>
<b>Capital Stock :</b>	
Preferred	\$24,393,700.00
Common	20,278,620.00
Reserves	4,000,061.40
Surplus	<u>12,763,680.88</u>
	<u>\$61,436,062.28</u>

outstanding, part in common stock, and the remainder in surplus and reserves. An analysis of a statement in this form could be used by a prospective purchaser of preferred stock in estimating the amount of risk which he would assume in this concern. The series of balance sheets mentioned would, of course, add materially to his information. The comparative balance sheet, however, will be discussed in the next chapter.

## CLASSIFICATION OF ASSET ACCOUNTS

In the illustrations given in the preceding sections the balance sheets were presented in summarized form. This is justified where it is desired that the balance sheet should convey general information with respect to financial condition since details are not desirable for this purpose. For other purposes, however, it is essential to keep rather detailed records of the asset accounts. The manager, for example, needs to know not only that the total fixed property amounts to a certain figure, but also the amount of the investment in each separate kind of property owned. That is, he asks the amount invested in a particular

machine, together with the present valuation of the machine, as shown by the books. In the same way, he should be able to determine original cost and present book value of all of the various asset items. For this purpose a property register is usually kept entirely separate from the general ledger accounts. In this register are listed all of the various kinds of property, showing the date of acquisition, original cost and probable service life. The amount of depreciation charged to expense for each class of property is also shown in such a way that the present value of each item can be determined by reference to a register. The total of the cost figures in the property register should equal the total of the fixed tangible asset items on the balance sheet. The total of the amounts charged to depreciation for each piece of property should equal the total reserve for depreciation. In other words, the property account as shown on the balance sheet is a controlling account for the cost figures of the property items on the property register. Also, reserve for depreciation is a controlling account for the valuation accounts for the various kinds of property. In the annual reports of some companies transcripts of such property registers are given to support the balance sheet figures. In the case of public utilities such records are of some importance in connection with determining the reasonable rate base.

The intangible asset accounts cannot usually be classified under sub-heads as readily as can the tangible. The reason for this is evident. Intangibles in the case of industrial concerns, at least, depend on the earning capacity and can be placed in one item such as goodwill. In the case of public utilities, however, there may be several intangible items. Interest during construction, going value, franchise value, etc., may be entirely distinct types of assets and in such a case separate ledger accounts should be kept for each type, although the total of all may be carried on the balance sheet under the heading "intangible assets." It is evident that records must be kept of the different types of securities listed among the fixed assets. If separate ledger accounts are not kept the securities themselves are kept in such a file that details concerning the different kinds of securities are readily available. The importance of this knowledge is evident particularly in the case of holding companies where

the question often arises as to the valuation of the securities held. Among the current assets the schedules of materials, goods in process, and finished goods are of importance to the manager. He should have some form of register of raw materials, showing the amount on hand, the amount purchased, and the amount put in the process of manufacture. The Materials account in the general ledger is a controlling account of such a register. The same information should be available for goods in process and for finished goods. A record of finished goods should be available for the purpose of outlining production and sales policies. This classification is for the purposes of the manager and should be constructed to meet his problems.

## XXVII

### COMPARATIVE AND CONSOLIDATED BALANCE SHEETS

THE form and content of the balance sheet together with a brief analysis of the balance sheet items were discussed in the last chapter. Comparisons between items on successive balance sheets, however, are so often the only source of analysis open to the investor that it seems advisable to stress the comparative balance sheet with respect to the proper analysis of the various items by the present or prospective investor. By considering such statements from this point of view it is hoped that their general as well as their specific functions may be better understood. This is also the case with the specific forms known as consolidated balance sheets.

#### THE COMPARATIVE BALANCE SHEET

It has been stated that the income sheet furnishes a historical exhibit of the operation of the business for a period of time, while the balance sheet furnishes a statement of the momentary financial condition. Even without the aid of an income sheet, however, a comparison of two balance sheets, one taken at the beginning of a period and one at the end, may throw considerable light on the intervening period. This fact is of considerable importance especially where published statements, without accompanying income sheets, furnish a series of balance sheets. The following comparative balance sheet for the X Company furnishes the basis for a discussion of the use of such a statement. (See next page.)

The amount of proprietorship is of primary importance. The common stock \$700,000, preferred stock \$500,000, sinking fund reserve \$25,000, and surplus \$239,115 give a total of \$1,464,115 for the proprietary accounts listed on the equity side for the year

COMPARATIVE BALANCE SHEET FOR THE  
X COMPANY, FOR DECEMBER 31ST

<b>Fixed Assets :</b>	<b>1916</b>	<b>1917</b>
Real estate	\$ 150,000	\$ 175,000
Buildings	325,000	315,000
Machinery and tools	425,000	510,000
Goodwill	100,000	100,000
Securities held for investment	115,000	315,000
<b>Working Assets :</b>		
Materials	220,000	230,000
Goods in process and on hand	180,000	300,000
Supplies	20,000	15,000
<b>Liquid Assets :</b>		
Investments in sinking fund	10,000	20,000
Cash	230,000	270,000
Accounts receivable	210,000	225,000
<b>Deferred Charges :</b>		
Unexpired insur. and advertising	2,600	2,200
<b>Valuation Items :</b>		
Loss on abandoned property	50,000	50,000
Discount on bonds	18,215	16,400
Discount on stock	40,000	20,000
	<u>\$2,095,815</u>	<u>\$2,563,600</u>
<b>Capital Equities :</b>		
Common stock	\$ 700,000	\$ 700,000
Preferred stock	500,000	550,000
Bonds	400,000	335,000
<b>Current Equities :</b>		
Notes payable	100,000	360,000
Accounts payable	80,000	255,000
<b>Deferred Credits :</b>		
Rent prepaid	1,200	1,200
<b>Valuation Items :</b>		
Allowance for depreciation	50,000	72,000
Allowance for uncollectible accounts	500	100
<b>Surplus and Proprietary Reserves :</b>		
Reserve for additions and betterments		200,000
Sinking fund reserve	25,000	50,000
Surplus	230,115	40,300
	<u>\$2,095,815</u>	<u>\$2,563,600</u>

1916. The valuation items, loss on abandoned property \$50,000 and discount on stock \$40,000, as shown on the asset side, deducted from this total leaves \$1,374,115 as the net proprietorship for that year. For 1917, the net proprietorship is stated at \$1,470,300. The same accounts are included in the computation in finding this figure with the addition of Reserve for Additions and Betterments account, \$200,000. The increase in proprietorship is \$96,185. How did this increase come about? Clearly it must have come either from new investment or profits retained in the business. An investor in this company would wish to know the source of this increase.

There are three possible explanations in this case, depending on the type of transaction which caused the increase in preferred stock. In the first place if the \$50,000 of preferred stock was issued to retire the same amount of bonds, *this* increase does not represent profits. The total profits retained in the business in this case would be \$46,185. In the second place, if the \$50,000 additional preferred stock were an issue of new stock for cash, the increase was not due to retained surplus in the business and, as in the first case, the actual amount retained during this period was \$46,185. In the third place, a preferred stock dividend might have been issued. If this were the case, the \$50,000 would not represent an actual decrease in surplus and the total increase in proprietorship, \$96,185, would represent net income retained in the enterprise. The average investor would be familiar enough with the business to know which one of these cases was the actual one. For the purposes of the rest of this discussion it will be assumed that the first of these possibilities, namely the exchange of stock for bonds, was the actual one.

The amount of proprietary net revenue can be ascertained with some degree of accuracy if the dividends paid are known. Suppose, for example, that six per cent or \$30,000 had been paid during the year on preferred stock, and that seven per cent or \$49,000 had been paid on common stock. In this case the increase in the proprietary accounts as shown in the comparative balance sheet plus the amount of dividends paid amounts to \$125,185. This can reasonably be taken for the proprietary net revenue. Of course if adjustments had been made to surplus, these would not have been taken into consideration in this item.



But in the average case such a computation would yield a significant figure. It will be noticed that this figure, 125,185, divided by 1,250,000, the par value of the stock outstanding, gives a rate of about ten per cent. This information is of importance to the stockholders.

The totals of the balance sheet were \$467,785 larger in 1917 than in 1916. Further, it was assumed that no new investment of fixed capital had been made. The valuation accounts were increased by \$21,600. After deducting this increase from the total increase there remains \$446,185, still to be accounted for. It is evident that this increase could come about only from one of two sources, increased surplus or increased current liabilities. The total surplus increased, as shown above, by \$46,185. Fifteen thousand dollars of this as will be shown later was used for retiring bonds. Further, \$20,000 of this increased surplus was used to offset stock discount. That is, the stock discount account was decreased by \$20,000 and this could only result from a charge against surplus. Therefore only \$11,185 of this total came about through retained surplus. The remainder, \$435,000, was caused by an increase in current liabilities. This may be verified by showing that the current liabilities actually increased by this amount. What was done with the funds obtained through this increase of current liabilities? It may be seen that current liquid assets were also increased by \$65,000 and working assets by \$125,000, therefore the total increase in current assets is \$190,000, as compared with the increase in current liabilities already mentioned. The balance, \$245,000, must necessarily be invested in more permanent property. The policy of using assets obtained through current liabilities for permanent property is questionable. If carried too far, it is bound to finally result in jeopardizing current solvency. In the case at hand, however, since the total of all current assets exceeds the current liabilities, the company cannot be so severely criticized. The point to be made, is that one should inquire into the situation in analyzing a comparative balance sheet. This would be of particular importance to a banker about to make a loan to the corporation.

A further analysis will reveal the fact that it is the policy of this concern to use its sinking fund assets for the purpose of buying back its own bonds. The Sinking Fund Reserve on the

equity side was increased by \$25,000 while the sinking fund assets were only increased \$10,000. The other \$15,000 must have been used for retiring \$15,000 par value of bonds. The bonds were decreased by \$65,000. It has already been shown that \$50,000 of this was caused by converting bonds into preferred stock. The other \$15,000 is explained by the investment of these sinking fund assets.

Thus it may be seen that such comparisons from comparative balance sheets shed considerable light on the business operation. Of course, it is impossible always to state that a special asset was used for a particular purpose or, conversely, that funds obtained through increases in special equities were used for other particular purposes, but reasonably certain conclusions may be drawn as to actual transactions, as was done in this analysis. It is convenient in making such comparisons to list the changes in parallel columns.

SOURCES FROM WHICH ASSETS WERE OBTAINED		UTILIZATION OF THE ASSETS	
Buildings	\$ 10,000	Real estate	\$ 25,000
Supplies	5,000	Machinery and tools	85,000
Unexpired advertising	400	Securities	200,000
Discount on bonds	1,815	Materials	10,000
Discount on stock	20,000	Goods in process	120,000
Preferred stock	50,000	Sinking fund invest.	10,000
Notes payable	260,000	Cash	40,000
Accounts payable	175,000	Accounts receivable	15,000
Allowance for depreciation	22,000	Bonds	65,000
Reserve for A and B	200,000	Allowance for doubtful	
Sinking fund reserve	25,000	accounts	400
		Surplus	198,815
	<u>\$769,215</u>		<u>\$769,215</u>

In the first column are listed all the accounts which show by comparison of the balance sheets either decreases in asset items or increases in equities. This column is headed "sources from which assets were obtained." It is assumed in making this heading that in ordinary business operation, if one asset decreases over a period this explains the receipt of another asset of equal amount. Also, each increase in an equity is accompanied by an increase in an asset of equal amount. In the second column are

listed all increases in asset items and decreases in equity items. This column is headed "utilization of the assets." It is assumed that an asset can be increased only through the utilization of some other asset and that equities are decreased through the use of assets.

The assumptions involved in these headings are not entirely logical, for in the first place decreases in assets may result in decreases in equities, and increases in assets may be the result of increases in equities. As these cases are not covered in the rules given the headings in this statement are somewhat misleading, but the items listed in the left-hand column may be grouped in one category and those in the right-hand column in another for the purpose of analyzing the balance sheet. Some accountants make a statement of this sort an end in itself, but it can readily be seen that such statements would be of very little use to the average investor in the enterprise. This statement is, in fact, a mere tool to be used in analyzing balance sheet items. The comparisons which were discussed in the preceding paragraphs could be obtained quite readily from this statement, and it is the comparisons that are ultimately desired. This method of analyzing comparative balance sheets is convenient in reading the published reports of corporations.

#### THE CONSOLIDATED BALANCE SHEET

The holding company organization has already been mentioned in previous connections, and in Chapter XXV a consolidated income sheet for a holding company was shown. Of equal importance to the consolidated income sheet is a consolidated balance sheet. It is customary for the holding company to prepare a balance sheet on the asset side of which are listed the securities of the subsidiary companies, and to prepare separate balance sheets for each of the subsidiary companies. This practice, however, obscures the fact which the average investor in the holding company desires to have presented. What is the condition of the property as a whole which is under the control of the holding company? It is in answer to this question that the consolidated balance sheet is prepared. This consists in a combination of all of the balance sheets of the holding company

and the subsidiary companies. The stock of the subsidiary companies is not carried as an asset in this case, but all of the assets and all of the equities are combined in arriving at a consolidated balance sheet.

As an illustration of the consolidated balance sheet, suppose that the A Company has purchased a controlling interest in the B and C companies and that the separate balance sheets of each are as follows :

## A COMPANY

*Assets*

## Fixed :

Real estate . . . . .	\$ 50,000
Building . . . . .	30,000
Patents . . . . .	25,000
Machinery . . . . .	15,000
Stock of B Co. . . . .	55,000
Stock of C Co. . . . .	<u>85,000</u>

\$260,000

## Current :

Merchandise . . . . .	\$ 25,000
Advances to B and C . . . . .	15,000
Accounts receivable . . . . .	20,000
Cash . . . . .	<u>5,000</u>

65,000\$325,000*Equities*

## Capital :

Capital stock . . . . .	\$200,000
Bonds (secured by stock of B and C) . . . . .	<u>50,000</u>

\$250,000

## Current :

Notes payable . . . . .	\$ 25,000
Accounts payable . . . . .	<u>10,000</u>

35,000

## Credit Valuation Items :

Reserve for depreciation . . . . .	10,000
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Surplus . . . . .

30,000\$325,000

## B COMPANY

*Assets*

## Fixed:

Real estate . . . . .	\$ 25,000
Buildings . . . . .	20,000
Patents . . . . .	10,000
Machinery . . . . .	25,000
Stock of C Co. . . . .	<u>5,000</u>

\$ 85,000

## Current:

Merchandise . . . . .	\$ 25,000
Notes receivable . . . . .	10,000
Accounts receivable . . . . .	8,000
Cash . . . . .	<u>13,000</u>

56,000

\$141,000*Equities*

## Capital:

Capital stock . . . . .	\$ 75,000
Bonds . . . . .	<u>50,000</u>

\$125,000

## Current:

Accounts payable . . . . .	\$ 3,000
Due to A Co. . . . .	<u>5,000</u>

8,000

## Credit Valuation Items:

Reserve for depreciation . . . . .	5,000
------------------------------------	-------

Surplus . . . . .

3,000

\$141,000

## C COMPANY

*Assets*

## Fixed:

Real estate . . . . .	\$ 15,000
Buildings . . . . .	25,000
Patents . . . . .	35,000
Machinery . . . . .	<u>30,000</u>

\$105,000

## Current:

Merchandise . . . . .	\$ 20,000
Notes receivable . . . . .	8,000
Accounts receivable . . . . .	10,000
Cash . . . . .	<u>15,000</u>

53,000

\$158,000

*Equities*

## Capital :

Capital stock . . . . .	\$100,000	
Bonds . . . . .	<u>20,000</u>	\$120,000

## Current :

Accounts payable . . . . .	\$ 3,000	
Due to A Co. . . . .	<u>10,000</u>	13,000

## Credit Valuation Items :

Reserve for depreciation . . . . .		12,000
Surplus . . . . .		<u>13,000</u>
		<u>\$158,000</u>

These balance sheets show the condition of each of the separate companies. In order to show the condition of the complete operating unit, the consolidated balance sheet will be given under the name of the A Company, as follows :

CONSOLIDATED BALANCE SHEET OF THE A COMPANY AND ITS  
SUBSIDIARIES

*Assets*

## Fixed :

Real estate . . . . .	\$ 90,000	
Buildings . . . . .	75,000	
Patents . . . . .	70,000	
Machinery . . . . .	<u>70,000</u>	\$305,000

## Current :

Merchandise . . . . .	\$ 70,000	
Notes receivable . . . . .	18,000	
Accounts receivable . . . . .	38,000	
Cash . . . . .	<u>33,000</u>	159,000
		<u>\$464,000</u>

*Equities*

## Capital :

Capital stock (outstanding) . . . . .	\$230,000
Bonds . . . . .	<u>120,000</u>

\$350,000

## Current :

Notes payable . . . . .	\$ 25,000
Accounts payable . . . . .	<u>16,000</u>

41,000

## Credit Valuation Items :

Reserve for depreciation . . . . .	27,000
Surplus . . . . .	<u>46,000</u>

\$464,000

There are several points which require consideration in preparing such a statement. All inter-company relations of a debtor or creditor character must be eliminated. The reason for this is evident. Among the current assets of the A Company is found the item "Advances to B and C, \$15,000." If this were considered an asset on the holding company's balance sheet, the current liabilities "Due to A Co. \$5,000," in the B Company's balance sheet, and \$10,000 in the C Company's balance sheet, would necessarily also be treated as liabilities in the holding company's balance sheet. In other words, the same accounts would be both assets and liabilities, hence these advances were eliminated in the holding company's balance sheet. The holding company often issues bonds which are secured by the stock of the subsidiary companies. In the illustration \$50,000 of the A Company's bonds were issued with the stock of the B and C companies as collateral. In the consolidated balance sheet the bonds of the A Company should be listed among the equities, but the stock of the B and C companies should not be listed as assets. It is clear that while the bondholders in this case would claim the stock in case of insolvency of the A Company the value of the stock would depend upon the assets of the B and C companies. The consolidated balance sheet, in other words, shows on the one hand the assets owned by all of the companies, and on the other side the equities held by those outside of the organization.

The chief advantage of the consolidated balance sheet lies in the fact that all accounts representing inter-corporate relations of the several companies have been eliminated. Consolidated balance sheets for many of the large corporations are published in the various corporation manuals. The following are the balance sheets of the American Telephone and Telegraph Company, the first being the general balance sheet of the company, the second being the consolidated balance sheet of the entire system for 1913:

## GENERAL BALANCE SHEET

American Telephone and Telegraph Company<sup>1</sup>

December 31

*Assets 1913*

Stocks of assoc. cos. . . . .	\$454,307,264
Advance to assoc. cos. . . . .	76,677,615
Telephones . . . . .	14,279,678
Real estate . . . . .	507,431
Long distance telephone plant . . . . .	49,269,173
Cash and deposits . . . . .	22,199,228
Spec. demand notes . . . . .	34,311,230
Accounts receivable . . . . .	4,404,689
Total . . . . .	<u>\$655,956,308</u>

*Liabilities 1913*

Capital stock . . . . .	\$344,616,300
Bonded debt . . . . .	159,591,000
Coupon notes . . . . .	5,000
Other notes payable . . . . .	34,300,000
Indebt'ness to West. Un. Tel. Co. . . . .	4,000,000
Div. payable January 15 . . . . .	6,892,326
Interest and taxes accrued . . . . .	3,091,571
Accounts payable . . . . .	932,298
Depreciation reserve . . . . .	36,836,187
Surplus . . . . .	65,691,626
Total . . . . .	<u>\$655,956,308</u>

From Moody's *Manual of Corporation Securities*, for 1914, page 2927.



## COMBINED BALANCE SHEET

(Entire System in United States)

December 31

*Assets 1913*

Telephone plant . . . . .	\$797,159,487
Supplies, tools, etc. . . . .	20,083,113
Receivables . . . . .	40,349,027
Cash . . . . .	31,888,858
Stocks and bonds . . . . .	<u>90,523,610</u>
Total . . . . .	\$980,004,095

*Liabilities 1913*

Capital stock . . . . .	\$395,224,531
Bonded debts . . . . .	341,147,485
Bills payable . . . . .	33,743,368
Accounts payable . . . . .	26,471,681
Employees' benefit fund . . . . .	8,919,335
Surplus and reserves . . . . .	<u>174,497,695</u>
	\$980,004,095

In the first of these statements it is possible to obtain but little information in regard to the telephone and telegraph property directly controlled by the holding company. In the second statement, however, the condition of the operating unit as a whole is shown. From this statement, for example, it may be seen that the telephone plant controlled by the company is valued at \$797,159,487 and the bonded debt of this property amounts to \$341,147,485. Further information in regard to the combined properties is available from this statement.

## XXVIII

### STATEMENTS OF INSOLVENCY

THE income sheet and balance sheet are the typical forms of statements for the going concern. In the case of insolvency or bankruptcy, however, some special forms of statements are necessary. No new problems of accounting analysis arise in these connections but the statements generally prepared are sufficiently technical to warrant a brief discussion in this chapter.

#### STATEMENT OF AFFAIRS

A statement of affairs is drawn up at the time a concern is declared insolvent, for the purpose of indicating the probable amount to be realized by the various creditors. No regulation form has been universally adopted, but the court generally demands some form of statement from the receiver. The procedure is somewhat as follows. A receiver is appointed to conduct the affairs of the concern on the date that it is declared insolvent. It is his function to wind up the business, convert the assets into cash, pay off the creditors according to their various claims, and finally, if there is any balance left, to distribute that to the proprietors. It is at the time of taking up the affairs of the insolvent concern that the receiver prepares the statement of affairs. This is made on the basis of the concern's own balance sheet, as of the same date. It has been shown in previous connections that the book values of assets to a going concern are greatly in excess of the liquidation values, hence an estimate is placed on the probable amount to be realized from each asset.

Next an investigation is made of the nature of the various claims of the creditors. Certain claims are entirely or partly

secured by specific property items. These liabilities must be deducted from the valuations of the specific asset accounts, in order to determine the amount available for unsecured claims. Preferred claims, such as taxes and accrued wages, must be shown as deductions from unencumbered property items in the proper place. All of this information can be placed in statement form. In order to show the procedure more concretely, the balance sheet of an insolvent concern will be taken as the basis for a statement of affairs.

### BALANCE SHEET, X COMPANY

May 31, 1918

<i>Assets</i>		<i>Equities</i>	
Land	\$ 135,200	Common stock	\$ 350,000
Buildings	320,224	Preferred stock	350,000
Equipment	482,052	Bonds	550,000
Bills receivable	19,708	Notes payable	318,600
Accounts receivable	13,867	Accounts payable	131,440
Finished goods	165,247	Accrued taxes	16,875
Raw materials	496,452	Accrued wages	115,400
Cash	29,153		
Deficit	170,412		
	<u>\$1,832,315</u>		<u>\$1,832,315</u>

In addition to the balance sheet of the corporation, the receiver ascertains the following facts. The bonds are secured by a mortgage on the land, buildings, and equipment. All other claims are unsecured. Taxes and wages are of course preferred claims. It is estimated that the land will bring \$140,000, buildings \$215,000, and equipment \$225,000 at forced sale. Further it is estimated that the bills receivable will net \$16,708, accounts receivable \$12,250, finished goods \$160,000, and raw materials \$230,000. On the basis of these facts, the statement of affairs exhibited on the following page may be prepared.

In the first column on the asset side are placed the book values of all assets as shown on the balance sheet. The total of this column is equal to the total of the asset side of the balance sheet minus the deficit item. The deficit is not listed in this statement,

# STATEMENTS OF INSOLVENCY

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## STATEMENT OF AFFAIRS, X COMPANY

May 31, 1918

### Assets to be Realized

	BOOK VALUE	ESTIMATED REAL- IZABLE VALUE FOR UNSECURED CREDITORS
Land	\$ 135,200	\$140,000
Buildings	320,224	215,000
Equipment	482,052	<u>225,000</u>
Realizable value of land, bldgs., equip.		\$580,000
Less bonds secured by mortgages		<u>550,000</u>
		\$ 30,000
 Bills receivable	 19,708	 16,708
Accounts receivable	13,867	12,250
Finished goods	165,247	160,000
Raw materials	496,452	230,000
Cash	<u>29,153</u>	<u>29,153</u>
Total	\$1,661,903	\$478,111
 Deduct the preferred claims —		
Accrued taxes		\$ 16,875
Accrued wages		<u>115,400</u>
		132,275
Assets available for distribution to other unsecured creditors		\$345,836
Deficiency		<u>104,204</u>
		<u>\$450,040</u>

### Liabilities to be Liquidated

	BOOK LIABILITIES	CLAIMS ON UNSECURED ASSETS
Bonds completely secured by mortgage	\$ 550,000	
Notes payable	318,600	\$318,600
Accounts payable	131,440	131,440
Accrued taxes (preferred claims deducted from assets)	16,875	
Accrued wages (preferred claims deducted from assets)	<u>115,400</u>	
Total	\$1,132,315	<u>\$450,040</u>

as it is a valuation account, an offset to proprietorship. On the liability side in the first column are listed all balance sheet equities with the exception of the proprietary items — common and preferred stock in this case. Proprietorship accounts are omitted from this statement entirely.

Next, the amount which each asset is estimated to realize is set down in a second column on the asset side. In case any such assets are pledged as security for specific liabilities the particular liabilities are deducted from the net valuation and the balance is carried to the column headed "Estimated realizable value for unsecured creditors." In this illustration, only one such case was given. The bonds were secured by a mortgage on the land, buildings, and equipment, hence \$550,000 for bonds was deducted from the net valuation of these three items and the balance of \$30,000 was carried into the last column.

The total estimated value of the assets available to meet the claims of unsecured creditors amounts to \$478,111. The claims of the preferred creditors (accrued taxes and wages) are deducted from this figure. This leaves a net amount of \$345,836, available to unsecured non-preferred creditors. In the second column on the liability side the unsecured creditors' claims are listed. The total of this column, \$450,040, minus the unpledged assets, \$345,836, shows the estimated deficiency, \$104,204. In the case of a corporation this loss is incurred by the unsecured creditors entirely unless some specific statute allows the corporation to assess the stockholders. This is usually not the case, however. In partnerships or single-proprietary enterprises, this deficiency can be made the basis of suit against the proprietors. In the illustration all of the proprietary equity is lost and the unsecured creditors lose the \$104,204.

The amount which each creditor will probably receive is found by dividing the unsecured assets, \$345,836, by the unsecured claims, \$450,040. This gives 76.8 per cent. In other words each of the unsecured creditors will probably realize seventy-six and eight-tenths cents on the dollar.

The last column on the asset side and the last column on the equity side constitute what may be considered a type of balance sheet. It is, in fact, a forced liquidation balance sheet. It is prepared for the purposes of the creditors primarily in order that

they may determine with some degree of accuracy the extent of their losses in dealing with the insolvent firm. The statement shown in the illustration was prepared according to the American form of balance sheet, — assets on the left-hand side and liabilities on the right-hand side. Some accountants reverse this procedure and place liabilities first and assets second. This appears to be a questionable procedure. One author suggests that the probable reason for this is that the statement of affairs is of English origin and that the American accountants who favor this form are simply following English practice.<sup>1</sup> It is logical for the English accountants to use this form inasmuch as liabilities are listed first and assets second on the balance sheet. A logical procedure in constructing American statements would be to place assets first and liabilities second.

#### DEFICIENCY STATEMENT

No changes are made in the ledger accounts at the time of preparing a statement of affairs. This is made out entirely as an estimate to be used for the purposes of judgment as to the extent of deficiency. The receiver then winds up the business, sells the assets for the best price he can get, pays the secured claims from the proceeds of the assets pledged, pays the preferred claims and finally pays what is left to the unsecured creditors. He keeps the accounts in the regular form and finally, at the time the whole business is liquidated, makes out a statement showing the results of receivership. This is usually in the form of a deficiency statement.

As each asset is sold Cash is debited for the proceeds and Deficiency account is debited for the difference between book value as shown by the last balance sheet and the proceeds, and the particular property account involved is credited. In case the proceeds exceed the book value of an asset the Deficiency account is credited for this amount. All expenses incurred by the receiver together with his own fee are charged to this account. The amount of the deficit, as shown in the last balance sheet, is debited to Deficiency and credited to the Deficit account. The

<sup>1</sup> See Hatfield, *Modern Accounting*, page 335.

balance in the Deficiency account, after these entries have been made, represents the total amount of loss to the equities. The stockholders' equities suffer first, and therefore an entry is made debiting Capital Stock and crediting Deficiency. In case the Deficiency account still shows a debit balance, this represents a final net insolvency which must be met by the unsecured creditors. If the amount realized on the assets by the receiver actually corresponds with the estimate in the statement of affairs, the net insolvency, as shown by the Deficiency account, will be greater than the deficiency item in the statement of affairs by the amount of the receiver's expenses and fees. For purposes of illustration it will be assumed that the receiver did realize the amount shown in the statement of affairs (above section) and that his fee is \$1,000 and expenses \$1,500. In this case the deficiency statement would be as follows:

## DEFICIENCY STATEMENT, X COMPANY

August 31, 1918

## Losses on Realization of Assets:

Buildings	\$105,224	
Equipment	257,052	
Bills receivable	3,000	
Accounts receivable	1,617	
Finished goods	5,247	
Raw materials	<u>266,452</u>	
Total losses	\$638,592	
Less profit on sale of land	<u>4,800</u>	
Net loss on assets		\$633,792

## Expenses of Realization:

Receiver's expenses	\$1,500	
Fee of receiver	<u>1,000</u>	2,500
Total loss and expenses of realization		\$636,292
Deficit previously reported by company		<u>170,412</u>
		\$806,704

## Stockholders' equities to meet losses:

Common stock	\$350,000	
Preferred stock	<u>350,000</u>	<u>700,000</u>
Net deficiency (loss to unsecured creditors)		<u>\$106,704</u>

The net deficiency shown by this statement, \$106,704, is just \$2,500 greater than the deficiency item in the preceding statement of affairs. This statement is in fact an income sheet for the receiver. He has shown losses and gains incident to the selling of the assets of the concern. Some accountants have advocated the use of several accounts to show the information contained in this deficiency statement. Such accounts as "realization," "liquidation," "settlements," etc., are often used. It may be that in special cases these additional accounts are of use, but in the average case the one given in the illustration is sufficient.





**PART SIX**  
**SPECIAL FIELDS OF ACCOUNTING**



## XXIX

### COST ACCOUNTING

As was suggested in Chapter I the problems of management give rise to a distinct and important branch of accounting, namely, *cost accounting*. In the preceding chapters the discussion of the accounting principles has been concerned primarily with the construction and analysis of accounts from the standpoint of the general interests of the equities involved — especially the proprietary equity — although the question of detail classification and comparison for managerial purposes has been introduced at various points. In the present chapter a brief statement of some of the essential features of cost accounting will be given.

#### THE PROBLEMS OF MANAGEMENT

Evidently the manager of a large scale and complex enterprise should have at his disposal if possible more extensive statistical information than that furnished by the ordinary system of double-entry accounts. It is true that the ledger accounts and the financial statements (especially the expense and revenue statement) furnish much data of value to the management, and that if the information presented by the expense and revenue statement is well classified, considerable light is thrown upon the process by which the resulting net revenue or loss is attained. In fact even the amount and rate of net revenue provides a crude test of efficiency through comparison with the similar items of other establishments in the same field of industry, and with the results of other periods of operation in the same enterprise. But in view of the present complexity of the industrial situation and the emphasis upon efficiency such information is rather inadequate for managerial purposes. From an ordinary

income sheet the manager can get little clue as to the prospects of maintaining a creditable showing; and, if the net result of operation is unfavorable, it is likely that only on the basis of detail classifications of expense and revenue according to some appropriate functional plan can an intelligent investigation as to causes be made and rational policies seeking to remedy the situation be formulated.

What are the more important questions of management which one may seek to solve with the aid of cost accounts and cost analysis? In the first place it may be noted that many business firms produce more than one product. In such cases it is not sufficient that total revenue and total expense be correctly ascertained and compared. The expense of producing each distinct commodity or service, and the revenue accruing from the sale of the same, should be determined if possible. This is a relatively simple matter as far as revenues are concerned (see page 141), but usually the allocation of expense to a particular line of product is (as will be explained a little later) a very difficult problem. In so far as such a classification can be made, however, its utility in directing production in a rational manner is evident. Some companies have discovered, after introducing a cost system, that one or more products were being produced at a loss. This fact had not been previously recognized because the loss thus suffered had been covered by profits on other lines. Similarly other firms have discovered that by specializing in a particular direction losses could be turned into profits.

While this is the day of specialization, very few enterprises are producing a single commodity or service and hence the problem of allocating expenses to a particular line of product is an almost universal problem of management. In many cases circumstances are such that the production of a number of products is unavoidable. This is usually the case where "by-products" are made. In such cases all costs are more or less joint. Even in these situations it is probably true that some allocation of costs is possible and desirable. It may be that in some industries, such as railroads, the problem is not capable of solution; and in such cases cost accounting is of doubtful efficacy. A classification of expenses in terms of the objects for which expenditures are made may be all that is possible

in certain cases. The problem of expense allocation will be further considered in the next section.

Although an enterprise may be producing but a single product, cost statistics may be necessary in order that the manager may have the information with which to make comparisons as to the efficiency of like productive units. If the enterprise consists of a number of plants performing similar functions, the general manager will wish to ascertain the relative efficiency of each of the various plants. Obviously this cannot be determined by inspection. The expenses and revenues pertaining to each plant must be segregated if the cost per unit of product from each plant is to be ascertained. Not only are comparisons between plants necessary in such a case, but efficient management requires a knowledge of the comparative performances of departments, production centers, and even individual machines. Even a record of the individual performance of each employee is desirable, for such information is of importance in improving labor efficiency. Such statistical analysis may be carried very far in some cases — indeed far beyond accounting in any proper sense. There is, always a point, however, at which the advantage to be derived from detail information is counterbalanced by the difficulty and cost of securing the information.

Even if an enterprise is producing but one line in the ordinary sense, cost analysis may be of utility in still another connection. The determination of cost per order or job is often a matter of considerable importance. The ship-building company, for example, turns out units of product of different sizes, design, and cost; and in many cases each unit is manufactured according to definite specifications. Similarly the building contractor constructs many types of buildings, the printing and publishing house makes many kinds of books, and the engine manufacturing company produces a variety of types of engines. In all these cases an analysis of costs in terms of specific jobs or orders may be an important factor in determining bids and in taking orders. The price-making function of cost accounting is often greatly exaggerated by cost enthusiasts, but in this connection the general utility of such statistical information is evident. Cost accounts may furnish a basis for bids without in any sense *determining* prices.

In connection with the utilization of the economic resources at the disposal of the manager still other problems of importance arise. What are the proper combinations of the productive factors? Or, in other words, what is the most effective process in view of all the market conditions? This may involve a comparison of the costs of various methods simultaneously in use, or of the costs of methods in use with those of possible methods. Many products can, of course, be produced by a number of processes. The manager must decide as to which is the most efficient. Certain castings, for example, can be sawed with hand tools at a simple work bench, or they can be cut by a practically automatic milling machine. Which process should be adopted? One method employs little capital and a large amount of current labor. The other process makes use of a high-priced machine and little direct labor. The cost per unit of output by each method should be ascertained. If labor is relatively high in price the second method may give a lower cost per unit. If the rate of depreciation on the necessary high-powered machine is high and repair and other maintenance charges heavy the first process may be the more profitable. Often it is necessary temporarily to use inferior methods concurrently with the most approved processes because of the nature of the equipment already purchased or because of certain unavoidable market conditions; but the classification of expenses between the different processes, if properly carried out, should give information which would be useful in guiding replacement and improvement policies.

The determination of the best method of remunerating labor is another problem of management. Statistical information concerning individual performances under different wage plans furnishes a basis for judgment as to the method which gives the greatest stimulus to labor under particular conditions, and hence is the most profitable.

On the basis of cost statistics the manager is able to set up standards of operation for all departments and phases of the enterprise. Such standards must, of course, be continually revised due to changing conditions. Further, it is necessary to compare such standards with the performances of other enterprises in the same field. But even if not applicable to

more than one enterprise, adequate standards as a goal for operating efficiency are of great assistance to the individual manager.

In any discussion of managerial statistics the point should be emphasized that much data of importance to the manager is not accounting or financial data in any proper sense of the term. Physical statistics are often of more importance to the manager than value statistics. A record of labor efficiency is best stated in terms of physical facts. Ton-mile and car-mile statistics in railway operation are of value to the manager but are evidently not accounting data. Further, while cost data may be of considerable use to the manager such facts cannot be directly used by those ultimately in control in determining the efficiency of management itself. The manager is not responsible for general economic conditions and hence has no control over material costs and labor prices. He is not responsible for all accidents, weather conditions, etc., and hence should not always be criticized because of high repair and maintenance charges. On the other hand the manager is supposed to exercise foresight and judgment in adjusting the needs of the enterprise to market conditions. Further, any significant variation in costs serves notice on those finally in control and calls for an explanation on the part of the operating management.

The treatment of interest charges in cost accounts is a question which has attracted a great deal of attention. According to the view stressed at various points in the preceding chapters interest is always a distribution of net revenue and is not an operating expense. The point has been repeatedly emphasized that no phase of the service of ownership should be capitalized in any sense and appear in the accounts as either an asset or an expense charge. The determination of net revenue is perhaps the most important function of the accounts, and this figure is shown by the difference between accrued revenues and *purchased* commodities or services expired in producing that revenue. Admitting, however, that the analysis of interest given in the foregoing pages is correct as far as the purposes of general financial accounting are concerned, it might still be urged that interest on invested capital should be treated as a cost for cost accounting purposes.

In the first place it might be said that the viewpoint of the



hired manager is quite distinct from that of the owners. The interests of the manager are not opposed to the interests of the equities, but are rather subordinate to them. In a sense the manager must look upon the establishment from the standpoint of an outsider. Not only is the disposition of all services and commodities purchased under his direction, but the disposal of the services of ownership itself (waiting, risk-taking, etc.) rests in his hands. Hence the manager might view the cost of production in the same light as does the economist who considers cost to mean the total *economic cost*, including interest and profits at the margin, necessary for the production of a particular product. Accordingly, in the comparison of periods of operation, different plants and departments, and processes of production, statistics showing total cost (including a fair return on the capital invested) per plant or per process are of importance. Particularly in comparing processes involving varying proportions of fixed capital and direct labor are such calculations of utility.

Cannot the manager, however, make such a calculation in the same way as would the owner without setting up interest charges as costs? In comparing methods is it not the one which yields **the greatest** return on the total capital invested which is the **most desirable**? This seems a fairly reasonable proposition, and to make comparisons in this way requires no fictitious expense charges in the cost accounts. Process A can be compared with process B on this basis by simply recognizing all depreciation, maintenance, and other actual operating costs in both cases, and computing the cost per unit of output for each method. Would it not obscure rather than clarify the actual situation for the manager if interest on invested capital were charged to expense in each case at some arbitrary rate?

At any rate if any interest charges are brought into the cost accounts at all the only logical procedure is to consider interest — *and reasonable profits as well* — on all the capital involved whether invested in fixed or working assets as a cost. If the outlay in question is a large one in which several equities are represented, it will be necessary to determine this cost on the basis of the different rates of return involved. In the case of a going concern where all the capital furnished is already amalgamated in one fund used for a variety of purposes any such

determination of the rates involved in a specific part of the investment is impossible. In fact the use of interest charges in cost accounts on anything like a rational basis is a procedure which faces almost insurmountable practical obstacles. It is probably this fact rather than the logic of the case that is causing cost accountants to begin to recover from the interest obsession.

Several recent discussions of the subject clearly show the impropriety of charging to expense arbitrary sums which will naturally bear no very close relation to rates actually realized year by year by the specific concern (which charges are adjusted by concurrent fictitious credits to revenue). The doctrine seems to have been due to a confusion of commercial concepts and practice with certain ideas of economic theory, and appears to be losing adherents.

#### THE CLASSIFICATION AND DISTRIBUTION OF EXPENSE

The central problem for the cost accountant consists in the classification and allocation of expense charges for managerial purposes on an appropriate functional basis or bases. The principal types of costs mentioned above in which the manager may be interested may be summed up as follows: (1) cost per plant or department; (2) cost per method or process; (3) cost per successive operation or stage in production; (4) cost per order or job; and (5) cost per line or unit of product. A particular system of cost accounts may be constructed with the idea of furnishing several such types of information, or the system may be organized in such a way as to stress simply one important line of analysis. In the following discussion reference will be made primarily to the questions that arise in allocating costs to successive production stages and to particular lines of product.

The total expense of operation may be classified into *direct* and *indirect* charges. For cost accounting purposes this is an important line of division. All materials and services consumed which can *evidently* be assigned to the production of a particular line of product, or to a specific process, operation, or department, constitute direct charges. The wages of a machine operative, for example, are directly assignable charges provided workman and machine are devoted continuously to a particular

purpose. On the other hand all materials and services consumed which cannot be allocated to definite functions, except on some more or less arbitrary basis, represent the indirect expense. The salary of a general superintendent is such a charge. Relatively few types of expense can be placed wholly in either class. Labor, for example, in nearly all cases must be classified into direct and indirect labor; and the same may be said of raw material and many kinds of supplies and services.

A further classification of expense conforms to the nature of the enterprise and the various stages of the productive process. Thus there is *manufacturing* expense and *selling* expense. The nature of the difficulties arising in making even such a simple functional division of expense charges was discussed in Chapter VII. The general and administrative expenses must either be grouped separately or apportioned arbitrarily between the manufacturing and selling departments.

The line of demarcation between direct and indirect expense is not obvious in many cases. Miscellaneous supplies such as oil, waste, small parts, etc., for example, are usually considered as an indirect expense, although as a matter of fact many such items enter directly into specific units of product and could be allocated to such product if the amount of clerical work involved did not render this inexpedient. Again the wages of a particular workman may be in part direct charges and in part indirect. An operative, for example, may be transferred from one task to another during the day. Part of his time may be devoted to repair work on the main power plant, and part to the operation of a machine. Careful records must be kept in such cases of labor time and its uses, if reasonable results are to be attained in dividing labor costs between direct and indirect charges.

Assuming that it is possible to distinguish between direct and indirect expense the problem of allocating indirect expense to specific departments, processes, and lines and units of product arises. The amount of indirect expense may be assigned to types of product in various ways. It may be spread over the entire output on some arbitrary basis, or it first may be apportioned between phases of the business, or it may be allocated directly to some smaller unit such as the job through the use of machine rates. Probably the latter procedure is the most

adequate, but it should be emphasized that whatever method is adopted some more or less arbitrary bases of distribution must be used. Where burden or indirect expense is worked into a machine rate the usual procedure is to divide the plant into appropriate production centers or machine units and use up the burden in determining the hourly cost to operate each unit. In making up these hourly costs different bases are used in distributing the different elements of the indirect charges. The cost of light, for example, may be distributed as a function of floor space. Cubic space, on the other hand, would seem a more reasonable basis for distribution in the case of the cost of heat.

In some cases it is found convenient to work nearly all costs, direct and indirect, into machine rates. In others, direct material and labor costs are handled separately. Often some element of burden is found practically unassignable, on any rational basis, and is not allocated at all. Evidently if this unassignable cost is relatively large the cost analysis is admittedly inadequate.

A method of allocation frequently employed is the distribution of indirect expense in proportion to the direct. For example, if the direct expense incurred in producing a particular unit of product is two per cent of the total direct expense for the period, then according to this method two per cent of the total indirect expense of the same period would be charged to this product. Similar methods are the distribution of overhead on the basis of a single direct cost such as that of labor or materials. Such methods are in most cases unsatisfactory. Usually there is a marked divergence between the percentages of direct and indirect expense involved in the production of particular units. Frequently a large percentage of direct expense goes with a small overhead charge. For example, the skilled workman receiving \$5 per day may be working at a task which requires for equipment only a work bench and hand tools, while another task requires an expensive automatic machine and the attention of an unskilled workman drawing \$2 per day. As far as solving the problems of the manager is concerned a distribution of charges on any of these bases is practically useless.

A large number of methods have been suggested for distributing

indirect expense.<sup>1</sup> A description of these is beyond the scope of the present discussion. No set rules are feasible for all cases. The conditions in any particular case must be thoroughly investigated and the various items constituting indirect expense must be allocated on the most scientific basis possible.

It is evident that the accuracy of cost analysis depends to a large extent upon the ease with which total expense can be divided into direct and indirect charges, and upon the proportion which these indirect charges bear to the total. Cost statistics undoubtedly are best adapted to manufacturing enterprises. In public utilities, where overhead or indirect expense forms about sixty-five per cent of the total cost, on the average, the efficacy of cost accounting is not certain. A railroad, for example, uses roadbed, track, and terminals—a very large portion of its equipment—for the production of a variety of services, and therefore a large portion of total expense is indirect, consisting of maintenance, depreciation, etc. The determination of the cost of a specific service under such conditions requires the use of arbitraries for such a large portion of the total charge as to make the result questionable. Nevertheless, much interest is developing in cost accounting for railroads, and it may be that a reasonably accurate system of costs is possible even for such enterprises. Up to the present time, however, the best results have been attained in other lines of industry.

A consideration of almost any intensive method of costing will raise a question as to its feasibility because of its complex nature and probable cost of adoption and maintenance. Most systems require the listing of data on the subsidiary records by large numbers of employees, and unless the necessary cards and sheets are very conveniently constructed it is hard to get satisfactory results from the figures of scores or hundreds of operatives. In view of these facts a cost system is largely a nuisance unless the data finally secured are founded on actualities and are not merely specious as is so often the case.

The work of the cost accountant consists in a large measure in the construction of a system of records which conforms to the nature of the particular enterprise and is adapted to disclose the

<sup>1</sup> *The Proper Distribution of Expense Burden*, by Church, is an admirable treatise on this subject.

facts necessary for the efficient management of that enterprise. Special ledgers and journals are necessary as well as subsidiary forms such as requisitions, production orders, time reports, process cards, store records, summary sheets, etc. It is in connection with the development of adequate stores accounting methods and devices for controlling and fixing the responsibilities of employees that cost accounting has perhaps had its greatest utility.

In conclusion it may be noted that although the cost records are usually constructed so as to intermesh with the accounts proper it is evident that cost accounting (in its accepted connotation) is quite distinct from the problems of general financial accounting, and represents a part of the statistical side of scientific management and efficiency engineering.

## XXX

### MUNICIPAL ACCOUNTING

THE discussion thus far has been concerned exclusively with the private business firm. It has therefore been necessary to emphasize the importance of the private equities. The municipal corporation is seldom thought of as a business enterprise, and for this reason it is often urged that scientific accounting principles do not apply. As an organization, however, a municipality may be compared to a business corporation. Both are corporations, receiving charters from the state. They are both governed and managed by a board — elected by the citizens in the case of the municipal corporation and by the stockholders in the business enterprise. They differ mainly in the purpose of organization. The city is organized for the purpose of rendering services to the citizens without profit (or for other reasons), while the business corporation is organized for producing net income for its stockholders. In order to cast an intelligent vote at the municipal elections, a citizen should have information in regard to the financial standing of the city and a history of the results of financial transactions during the preceding period. The statements required for this purpose are much the same as those prepared for the business enterprise; namely, the balance sheet and the income sheet.

Furthermore, the governing board or the city manager requires information of a nature similar to that required by the manager of an industrial plant. This is needed in order that a rational judgment may be made as to the efficiency of the organization. The recent development of the commission manager form of government is a recognition of the fact that a city, after all, is much the same as a corporation and should be managed as such. Hence municipal cost accounts are of importance.

That very few cities present financial statements that are adequate for the purposes mentioned is a well-known fact. The accounting systems for cities are generally of the primitive cash book class, that is, transactions are recorded only as cash is received or paid by the city, and the only statements which are prepared at the end of the year are those which show the amount of cash received and disbursed during the year. It is the purpose of this chapter to explain briefly the use of the standard accounting statements for the municipal enterprise.

#### THE MUNICIPAL BALANCE SHEET

The council is intrusted with the administration of certain properties, and unless a proper statement of the condition of these properties is given at the beginning and end of each year, the council cannot be held to a strict accountability for its administration. The statement which should be used for this purpose is the balance sheet. The assets in this case would consist of all properties owned by the city, actual improvements to public streets and parks, all uncollected taxes and assessments, and actual cash balances in the various funds. The liabilities would consist of the bonds outstanding and the current liabilities incurred but not yet paid. The difference between the assets and the liabilities is the surplus. This represents the amount of permanent assets which have already been paid for. This item is the only account appearing on the balance sheet which is not a strictly private equity. It represents the collective public equity in municipal property. Thus it may be seen that the property-equity classification applies to the municipal accounts as well as to the private concern's accounts.

Balance sheets prepared each year may be used for comparative purposes and will give a clear idea of the policy of the city. They will show whether a city is paying for its improvements as it goes, or is accumulating a debt to pay for current services. As long as the value of the assets exceeds the liabilities, the city is paying as it goes; but when the liabilities exceed the assets, a debt is being laid up against the future.

It would be a relatively simple matter for most cities to prepare a balance sheet each year, although the first one would



present some difficulties. An appraisal should be made of all land owned by the city by a person competent to judge of land values. This figure would constitute the land value on the first balance sheet. As new land is acquired, all costs of acquiring title should be debited to this land asset account, and as any land is disposed of by the city, the value as appearing in the balance sheet should be credited. This would always leave the land account on the balance sheet at a figure representing the cost of the land owned. Of course permanent increment in land value may be taken into account in the same manner as was shown for the business enterprise.

The buildings and structures may be appraised on the basis of cost to reproduce (or original cost if that figure is available) minus depreciation. The value of the buildings in the balance sheet should always be the value at the date the balance sheet is prepared. This will insure that a proper portion of the cost of the buildings will be charged as expense each year. Furthermore, this will have a good effect on the method of financing. Suppose that a municipal building has been erected at a cost of \$80,000 and it is shown by the Building account to be worth \$40,000 at the end of the tenth year; and that \$80,000 of the bonds are still outstanding with no sinking fund to retire them. It will readily be seen that some source of revenue must be found to meet the \$80,000 due in ten years. If the bonds were to run to maturity without a sinking fund to retire them, and if the building were to be destroyed at that time, the future citizens would be compelled to pay for a building which had been completely consumed. Situations of the sort described often occur under present methods.

Public improvements such as paving can also be valued on the basis of cost of reproduction less accrued depreciation and the same can be said of all other permanent property items. Once valuations have been placed upon the fixed asset items, the continued revaluations can be made at the end of each fiscal year just as though the property belonged to a private corporation. Methods of accounting for depreciation apply with equal force to the assets of a municipal enterprise.

The balance sheet is completed by placing the liabilities in a column opposite the assets. General ledger accounts may be

opened for each asset and equity item and subsequent entries made according to ordinary commercial accounting principles. The ease with which such a statement can be prepared and with which subsequent transactions can be recorded answers the objection so frequently urged against the municipal balance sheet; namely, that it is next to impossible to prepare one.

Another objection which should be considered seriously is that such a balance sheet is of no importance after it is prepared. It is urged that such a statement is not needed to guide the actions of the investor in municipal properties as in the case of the private concern, and that a simple schedule of property would be sufficient for managerial purposes. These statements are both true. The private investor in municipal bonds is not concerned with the valuations of civic assets in the balance sheet; he is concerned with the legality of the bond issue and the ability of the city to assess taxes sufficient to cover his claim. Admitting all this, it may still be claimed that the balance sheet serves a function. One of the principles of public finance is that each generation should pay its own operating expenses, and the balance sheet is the only definite statement which shows whether this is being accomplished or not. This fact alone is sufficient justification for insisting on the importance of such a statement.

#### THE MUNICIPAL INCOME SHEET

If current operating expenses are to be met out of current taxes, an income sheet is necessary. A budget is required of the city council at the beginning of each year in which the estimated expenses for the ensuing year are stated together with the amount of revenue required. On the basis of this budget the taxes are levied. Expense statements for previous years are the basis for budget estimates, hence it is essential that the expenses be correctly stated.

The statement from which the budget is prepared in most cities at present is the cash statement. It was shown in Chapter X that such a statement does not show actual expenses and that in many cases its use leads to entirely erroneous conclusions. This being the case, it is clear that it should not be used for budget making. What is needed is a statement which shows

actual expenses, regardless of whether cash is paid for the same within the period or not, and the revenue accruing in the same period regardless of the amount of cash received — in other words an income sheet.

A cash statement is of importance in the municipal enterprise. It can be used for checking the stewardship of the city treasurer. But this is the limit of its effectiveness and it should not be used as a substitute for expense and revenue accounts.

Comparisons of the expenses of one city with those of another and also between expenses incurred by one administration with those of a preceding administration in the same city are of interest. For these purposes actual expenses are desired, not cash disbursements. Where cash statements are depended upon for these purposes it has often been the practice of certain retiring officials to make large purchases immediately before leaving office in order that the disbursements of the succeeding year will be large and reflect discredit on the new officials. Such practices would not be effective were expense statements used for comparative purposes. With a statement of expenses to be prepared each year, the various department heads attempt to show lower expenses for the same service performed or greater services for the same expenses reported by preceding years. This puts the city's affairs on a more business-like basis.

For the purposes of direct administrative control it is essential to classify the expenses of each department so that standards of operation can be set up in much the same way as for the private enterprise.<sup>1</sup> A further purpose of such a classification is to obtain unit costs of services which can be used in estimating the expenses incident to instituting new methods of operation. In the larger cities an elaborate system of cost accounts is essential to proper administrative control. The managing officer or even the departmental head is confronted with many, if not all, of the managerial problems mentioned in the last chapter. In the smaller cities a simple expense classification will often be of sufficient service.

The following outline suggests some of the more important

<sup>1</sup> See Chapter XXV.

kinds of information which should be supplied by classified expense accounts. In a small city the items in the outline might be used as ledger accounts; the list of accounts in this case would be complete. In the larger cities, each of these items would be subdivided in much greater detail.

1. Police Department.

- (a) Administration.
- (b) Patrol Expenses.
- (c) Traffic Regulation.
- (d) Enforcing Municipal Ordinances.
- (e) Maintaining Buildings and Equipment.
- (f) General Operating Expenses.

2. Fire Department.

- (a) Administration.
- (b) Fire Prevention.
- (c) Fire Fighting Expense.
- (d) Maintaining Buildings.
- (e) General Operating Expenses.

3. Health Department.

- (a) Administration.
- (b) Statistical Expenses.
- (c) Inspection.
- (d) Hospital Service.
- (e) Sewage Disposal.
- (f) General Operating Expenses.

The expenses of each of the other administrative departments would be subdivided in this same way. In the case of departments furnishing commercial services such as the supplying of water, electricity or street railway service, it is necessary to classify both revenue and expense accounts. It is usually the purpose to charge the consumer for such services at approximately cost. Revenue and expense accounts should therefore be classified in convenient form for comparative purposes. The following is an illustration of a classification for a water department which could be used by small cities.

**Water Department.****Revenue :****Private service.**

- (a) Metered.
- (b) Unmetered.

**Municipal service.**

- (a) Fire protection.
- (b) Parks.
- (c) Public buildings, etc.

**Miscellaneous revenue.**

- (a) Special work.
- (b) Meter rentals.
- (c) Sundry accounts.

**Expenses :****General.**

- (a) Administration.
- (b) Insurance, etc.

**Operating.**

- (a) Operating management.
- (b) Collection system.
- (c) Distribution system.

**Maintenance.**

- (a) Collection system repairs.
- (b) Distribution system repairs.
- (c) Depreciation on plant.

**THE MUNICIPAL BUDGET**

The power of control over city finances which is retained by the citizens is their right to approve or disapprove, at the municipal elections, of the council's method of administration. In order that this right may be exercised in an intelligent manner, a financial program should be approved by the citizens at the beginning of each fiscal year. The statement to be supplied by the city officials for this purpose should contain a report of the financial results of the previous year's activities, and the plans of the administration for the ensuing year, together with the costs and the contemplated means of raising the necessary funds. The ordinary practice of city councils is to publish a statement

of receipts and disbursements, together with an estimate of the cash to be raised during the following year through taxes. Although the name *budget* is often attached to such a statement, it furnishes little of the information needed by the citizens, nor has it proved effective in placing a limitation on the expenditures of city councils.

The most important function of municipal accounts is the furnishing of the material for the preparation of the budget. The statements which have been described are adequate for this purpose. The balance sheet shows the additions and improvements during the year, and may be used for estimating the cost of the improvements contemplated for the ensuing year. Each department head should supply the council with a statement of the future needs of his department to aid in making the estimates. The budget should be published for the benefit of the citizens.

The usual method employed by city councils in apportioning the income is to make appropriations throughout the year as the municipal wants make themselves manifest, until no funds are left. Under this method the services which are not desired until late in the fiscal year are omitted rather than the ones which are least important. This practice would be prevented by the adoption of the budget each year. After it has been determined finally what items should remain in the budget in order to keep the tax rate within the limit, the budget should be embodied in an ordinance and passed by the council. It should be unlawful for the council to spend more than the budget ordinance allows for any service, thus insuring that the program entered upon at the beginning of the year will be strictly adhered to.

Although the council should not be allowed to expend more than the budget allows, there should be some method provided by which an error in an estimate might be corrected and additional funds granted for particular purposes. Cases might arise in which an underestimate was made that would cause a loss to the city if the project were not completed. The method of correcting the error should be so difficult, however, that the council would resort to it only in cases of extreme necessity. The budget thus adopted should prove an effective means of control over the city administration. It furnishes the information on

which to compare one administration with another, and presents a clear statement of what is to be done with the amount collected in taxes.

The details of technique in maintaining a municipal accounting system on the plan shown in this chapter are somewhat complicated. The tax collections are made into specific cash funds and the city is usually prohibited by state statutes from using the cash from any one fund for other purposes than those listed as covered by the fund. It becomes necessary therefore to make a considerable number of what may be called internal book entries. Accounts called Budget Allowances, Available Cash Balance, Encumbered Balances, Unencumbered Balances, etc. are necessary to record all possible transactions. It would be beyond the scope of a general text in accounting to explain the details of this technique. It is sufficient here to emphasize the importance of sound accounting principles in the municipality.

## XXXI

### RAILROAD ACCOUNTING

THE controversy concerning the relative merits of public and private ownership in the field of quasi-monopolistic industry, and the present decided tendency toward the extension of governmental control in this direction, have given rise to distinctive economic and accounting problems. These facts, together with the physical peculiarities of public utility enterprises, make public utility accounting a special field of considerable importance.

In the field of public utilities the railways constitute the most important industry. Further, in this industry both public regulation and accounting practice are most highly developed. In this brief discussion of public utility accounting, accordingly, attention will be directed chiefly to the railways.

#### THE I. C. C. CLASSIFICATIONS

The Hepburn Act of 1906, which gave to the Interstate Commerce Commission the right to prescribe uniform accounting methods for transportation agencies engaged in interstate traffic, recognizes the fact that public regulation of industry can be made more effective through the control of the accounts. Furthermore, this law recognizes that intelligent and just regulation is possible only on the basis of the information furnished by an extensive analysis of the accounts. Under the authority of this act the Commission has constructed uniform systems of accounts for the public utilities under its jurisdiction. The most important example of one of these systems is that prescribed for steam railways. This system is classified into six groups of accounts as follows: (1) *investment in road and equipment*; (2) *operating expenses*; (3) *operating revenues*; (4) *income*; (5) *profit and loss*; and (6) *balance sheet*. A brief



examination of the classifications of this system will serve to suggest some of the characteristics of railway accounting.

The classification, investment in road and equipment, includes the accounts which represent the cost of the fixed assets used in operation. This classification provides for three "general" and seventy-seven "primary" accounts. The general or summary accounts are: Road; Equipment; and General Expenditures. Example of primary accounts under Road are: Engineering; Land for Transportation Purposes; Ties; Rails; Station and Office Buildings; Roadway Buildings; Shops and Engine Houses; Telegraph and Telephone Lines; etc. Equipment covers the following subsidiary accounts: Steam Locomotives; Other Locomotives; Freight-train Cars; Passenger-train Cars; Floating Equipment; Work Equipment; and Miscellaneous Equipment. Those under General Expenditures are: Organization Expenses; General Officers and Clerks; Law; Stationery and Printing; Taxes; Interest during Construction; and Other Expenditures—General. The railroads are not restricted to the use of the primary accounts prescribed by the Commission—a greater or less number may be used according to the needs of the particular case, but no option is allowed as to the character of the items entering these accounts.

Previous to 1907 (when the prescribed classifications went into effect) it had been the practice of many railroad companies to enter in the property accounts an amount equal to the par value of the securities issued, to avoid showing discounts on securities on the balance sheet. Unreasonable construction company profits also often contributed to inflated property values on the first balance sheet. Furthermore, the accounting treatment of the property items after construction has varied more or less with the success of the enterprise. Thus roads making large earnings often charged improvements to expense. Other roads with small earnings continued to inflate property values by charging replacements to capital. Consequently the value of the property as shown by the accounts often does not approximate actual values as far as construction prior to 1907 is concerned. This situation is unfortunate since the value of the property used is a particularly important matter in railway accounting. The problem of valuation is of more significance in the case of public

utilities than in competitive industry because of the accepted theory that rates should yield a fair return on the investment. The purpose of the present federal valuation project is in part at least an attempt to correct the figure, investment in road and equipment, as it now stands upon railroad balance sheets.

It would seem to be the purpose of the entries in the accounts of this classification to maintain the balances of these accounts at the actual value of the property used for furnishing transportation services. In this respect, however, the rules of the Commission have been conservatively formulated. This is particularly noticeable in connection with the rules covering the replacement of certain kinds of property. When an item of abandoned property such as ties is replaced, for example, the rules prescribe that "the excess cost of metal ties applied in place of wooden ties over the cost at current prices of replacing in kind the wooden ties removed shall be charged to road equipment account No. 8, 'Ties.'"<sup>1</sup> In other words in a period of rising prices the amount appearing in the Ties account may be less than the actual cost of the ties in use. Suppose, for example, that the current prices of wooden ties represent an advance of twenty per cent over the cost of the ties being replaced, and that the cost of the metal ties used is still ten per cent higher. The application of this ruling would evidently mean that the accounts would show but a ten per cent increase in property, although the new ties actually cost thirty per cent more than the property removed. If the property is replaced in kind, but at a higher price, the property account would represent the cost of the *original* item rather than of that now in use. In case the property is replaced in kind but at a lower price there would again be no adjustment in the asset account and an overstated property value would be shown.

These rules are evidently not in agreement with those explained in Chapter XXII which state the correct procedure for ordinary replacement accounting. Even if accrued market changes are ignored it would seem sound practice to follow actual investment values in recording replacements as in accounting for new construction; for otherwise the company building a new extension in a year of high prices is allowed a high property valuation

<sup>1</sup>*Classification of Operating Revenues and Operating Expenses for 1914*, p. 42.

while a company making extensive replacements in kind in the same year is allowed no increase.

As stated above it would seem especially important in the case of public utility enterprises that the accounts should be as sensitive as possible to changes in the price level, for in this way changing capital costs can be recognized and the rates allowed adjusted to meet the new situation. The rulings mentioned in a period of rising prices would work to the disadvantage of the investor. In a period of falling prices such regulations are detrimental to the interests of the public. In either case the accounts fail to represent the value of the property marketwise; and even if the basis for valuation is to be the sacrifice of the investor the fluctuations in monetary values must be accounted for to obtain this result, as was explained in Chapter XX.

It must be remembered, however, that the fact of price regulation in itself makes the market of less significance. Prices on the cost side are still competitive, but on the revenue side are more or less fixed. Such a situation requires the recognition of other considerations than the market in making valuations. Further, although it is usually conceded that American railways are not at present highly over-capitalized as a rule, it is recognized that a more or less arbitrary conservatism is necessary to offset tendencies among railway managements in the other direction. The question of valuation in public utility enterprises will be further considered in the next section.

The classification, investment in road and equipment, includes only the accounts with property used for transportation services as was stated above. It is a familiar fact, however, that many railway enterprises own other assets such as investments in subsidiary and other companies, sinking funds, mineral lands, commercial power plants, hotels, etc. The accounts with such items are included in the balance sheet classification.

The operating expense classification has the following general accounts: Maintenance of Way and Structures; Maintenance of Equipment; Traffic; Transportation — Rail Line; Transportation — Water Line; Miscellaneous Operations; General; Transportation for Investment — Credit. These accounts are subdivided into two hundred and ten primary accounts. Under the head of maintenance of way and structures there are seventy-

nine primary accounts. Examples of these accounts are: Superintendence; Roadway Maintenance; Roadway Depreciation; Bridges, Trestles, and Culverts; Ties; Ties — Depreciation; etc. There is a maintenance or repair account for each important type of property, and usually an accompanying depreciation account. In many cases under maintenance of equipment three expense accounts are provided in connection with an important type of property, for example: Freight-train Cars — Repairs; Freight-train Cars — Depreciation; and Freight-train Cars — Retirements. The last named account is charged with the amounts necessary to adjust the difference between the book value (less scrap value) of the property units retired from service and the amount of accrued depreciation in the reserve account applicable to the units retired.

The general account Traffic covers such primary accounts as Superintendence, Advertising, Traffic Associations, Industrial and Immigration Bureaus, Insurance, etc. Under Transportation — Rail Line there are fifty primary accounts. These accounts include under the appropriate heads the charges for wages and salaries, supplies, etc., in connection with actual operation. The expenses of "miscellaneous operations" include the cost of dining and buffet service, of operating hotels, elevators, stock-yards, etc. "General Expenses" covers administrative salaries, legal and valuation expenses, general insurance, supplies, and similar items. The last general account mentioned, Transportation for Investment — Credit, is not really an expense account at all but is an adjustment or clearing account which is credited with "fair allowances representing the expense to the carrier of transporting, on transportation trains, men engaged in and material for construction." The amounts so credited are concurrently charged to the appropriate property accounts.

In this classification the line between expense and capital is very carefully drawn, but it is evident from the above discussion of the treatment of replacements that the rules of the Commission do not apportion charges between capital and revenue in strict harmony with accounting theory. Thus when rails are replaced with more valuable types operating expense is charged with the cost of replacing the old rails in kind rather than with the

value of the abandoned units as represented in the property account.

The operating expense classification is constructed primarily to meet the needs of the operating manager, and to fix the responsibilities of employees. The general purpose of this classification is to exhibit the cost of rendering the *service of transportation*. It is noticeable, however, that the primary accounts used conform to the important classes of commodities and services purchased and consumed, and to the important types of equipment and other properties in use, and that little attempt has been made to classify expenses on an elaborate functional basis. This division of accounts, for example, does not even present the cost of passenger traffic as distinct from the cost of freight traffic; and there is clearly little attempt in this classification to construct the accounts so as to reveal the cost of carrying a particular kind of freight. As was explained in Chapter XXIX cost accounting for railway enterprises is of very doubtful efficacy. The indirect expense — the depreciation and maintenance of road and equipment used for various purposes, for example — is so large a fraction of the total expense as to make any apportionment of charges merely a specious division.

In the matter of depreciation charges considerable leeway is allowed the railroad companies. No set rule or rules for measuring depreciation are prescribed. The carrier itself is allowed to estimate the annual depreciation charge, but is required to charge one-twelfth of this estimated amount to the operating expense of each month. In case the amount of abandoned property is far in excess of the reserve for depreciation for the type of property involved, the company may, upon specific authority from the Commission, carry the item on the balance sheet as a deferred expense to be distributed in the operating expenses of succeeding periods. The Commission may also grant the company permission, under the rulings, to charge an unusual loss item to Profit and Loss. In view of what was said about the treatment of deferred debits in Chapter X it would seem more proper to *always* make these adjustments through a surplus or profit and loss account. According to the theory, however, that the railway investor is entitled to revenues

sufficient to cover such losses the carrying of abandonments as deferred assets may be justified.<sup>1</sup>

The operating revenue classification is divided into four general accounts as follows: Transportation — Rail Line; Transportation — Water Line; Incidental; and Joint Facility. The primary accounts are thirty-nine in number. Examples of these accounts are: Freight; Passenger; Excess Baggage; Mail; Express; Switching; Special Service; Dining and Buffet; Parcel Room; Demurrage; Telegraph and Telephone; etc. The Joint Facility account is used to record adjustments of revenues between companies in connection with the operation of joint tracks, yards, terminals, etc. The fact that railway operations in the United States are in many respects bound into a single system is illustrated by these special revenue accounts. Standardized equipment and through traffic necessitate joint property and joint operating records; and the work of the railway accountant is naturally considerably modified by these inter-company relations.

The revenue classification is not as elaborately developed as is that of operating expenses. It might be considerably expanded and better serve the needs of the traffic officials. The construction of a system of revenue accounts on a functional basis is not a very difficult matter as was explained in an earlier chapter.

In the rulings covering the revenue classification the importance of recognizing accruals is emphasized. This is noteworthy in view of the fact that railroad revenues are so largely on a cash basis. It is recognized that even in such a case the record of cash transactions is not a satisfactory guide in accounting for revenues.

The classification of income accounts prescribed for railways corresponds roughly to the net revenue section of the general income sheet discussed in previous chapters. There are some noticeable differences between the two, however. The railway income accounts are not confined to net items. The total of operating revenues is shown in a special account in this classification as is also the total of operating expenses. Special accounts are provided for non-operating income such as hire of freight

<sup>1</sup> For a further discussion of the treatment of abandonments and other phases of railway property accounting see Adams, *American Railway Accounts*.

ars, rent from locomotives, income from lease of road, dividend income, income from funded securities, etc. Accounts are provided for the corresponding deductions from income including taxes. The inclusion of rent items as debits and credits to income accounts is not in agreement with the construction of the net revenue classification as it has been outlined in preceding chapters. Rent or hire as ordinarily understood is a *gross* item, and accordingly constitutes either expense or revenue as the case may be. According to the rulings of the Commission, however, the rent accounts included in this classification shall be charged or credited only with that portion of the payment or receipt which is net income. The balance in each case is to be apportioned between depreciation and maintenance charges in the case of a payment, and is to be credited to these expense accounts in the case of a rent receipt. Such a division of rent would be a matter of little significance in ordinary commercial accounting for evidently any sale of a commodity or service contains an item of net income; but in railroad accounting it is particularly important that the actual expense of operation be revealed for rate-making purposes, and hence such a practice may be justified in this case.

The profit and loss classification covers essentially the accounts which show surplus adjustments. Special accounts are provided for unusual gains such as donations, for unusual losses, dividend appropriations, surplus appropriations, etc. One questionable procedure at this point may be noted. The railroads are allowed to "charge to profit and loss account No. 617, 'debt discount extinguished through surplus,' all or any portion of the discount and expense on funded debt remaining at any time unextinguished." This procedure is inconsistent with the theory that the income sheet should exactly represent the fiscal period. If discount on funded debt is not accumulated through the annual interest charges, net proprietary income will not be correctly stated each year.

The prescribed arrangement of the income and profit and loss items in the railway income sheet is shown in the illustration given in Appendix C.

The balance sheet classification includes the regular property and equity accounts. Among the property accounts are Invest-

ment in Road and Equipment and miscellaneous property accounts such as Improvements on Leased Railway Property, Sinking Funds, Cash, Investments in Affiliated Companies, Loans and Bills Receivable, Rents Receivable, etc. The equity accounts cover the stocks and bonds outstanding, the appropriated surplus accounts, the profit and loss balance, current and deferred liabilities, valuation reserves, etc. A peculiar account, Grants in Aid of Construction, is used to cover the donations made by states, municipalities, and other public corporations applied to the construction or acquisition of property the cost of which is chargeable to investment in road and equipment.

The prescribed form of the railway balance sheet is shown in Appendix C. The asset side is divided into four main groups of items: investments; current assets; deferred assets; and unadjusted debits. As in most balance sheets valuation items are not carefully segregated. Items of discount and abandoned property appearing under unadjusted debits are virtually deductions from proprietorship. Rents and insurance premiums paid in advance, on the other hand, are clearly deferred assets. Similarly on the liability side a current liability such as taxes accrued and a capital liability such as premium on funded debt are included with valuation reserves for depreciation under the head of unadjusted credits.

It is noticeable that two columns are provided for each side of this balance sheet. One purpose of the "short" column is to show contingent items such as the guaranteed securities of other companies which are not included in the final totals. Treasury stocks and bonds are also shown in this way. Only the actual amount outstanding is shown in the "long" column in each case. It might be advisable to show the depreciation reserves also on the asset side in order to indicate their nature as property deductions. A point of interest in connection with the liability accounts is the distinction made between matured obligations unpaid and unmatured obligations accrued. In determining the immediate financial condition of a company it is evident that this is a matter of some importance.



## RATE REGULATION AND ACCOUNTING

When public control of industrial enterprises extends as far as the direct regulation of prices the importance of sound accounting analysis for such cases is in some respects greatly emphasized. In industries where prices are fixed by competition the public has comparatively little immediate interest in enforcing correct accounting practice. Competition is confidently expected to set a proper level of prices regardless of how the accounts are kept. In such cases it is the present or prospective owners and the circle of business men connected with the enterprise in financial or industrial relationships whose interests are served by sound accounting.<sup>1</sup> The enterprise which is proceeding on the basis of extensive statistical information in regard to the property and equity facts which represent its financial status is, of course, better able to survive the rigors of business competition than an enterprise which operates more or less blindly. But overstatement or understatement of property or expense, and consequent inaccurate income and balance sheets, cannot affect prices to the consumer (in any immediate or direct sense) where competition fixes these prices. In the case of public utilities, however, the state undertakes to control rates, and — as was suggested above — reasonable rate regulation is impossible without proper accounting and equitable valuations.

It is urged that the public utility investor is entitled to a "reasonable return on a fair value" of the property. Just what this well-worn phrase means is a matter of some dispute. Is the "fair value" cost, cost less depreciation due to physical causes, or present value as determined by both operating and market conditions? And how is the reasonable return to be determined? It has been urged throughout this book that the accounts should register current property values *as far as this is possible or practicable*. It has been explained that depreciation is a matter of value decline and does not depend entirely upon physical causes. Further, it has been shown that unless value changes in both directions are made matters of accounting record the accounts

<sup>1</sup> Public interest is, of course, advanced by an efficient utilization of the economic resources of the community. To the extent that accounting makes possible efficiency in production, accordingly, its function is social as well as private.

do not show either the capital cost of production or the real sacrifice of the investor. But the rulings of the Interstate Commerce Commission, as was explained above, emphasize *original cost* as the proper basis for the valuation of public utility properties. It has been argued that this is not the most rational viewpoint as applied to general competitive industry. The question now arises as to whether original cost is the proper basis for determining property values in the case of public utilities.

One of the chief arguments in favor of maintaining original cost in the accounts is based on the contention that this figure represents the sacrifice of the investor. As was explained in Chapter XX this would be true only in a régime of static prices. In order to follow actual original investment it would be necessary to account for monetary fluctuation. In so far as changes in the prices of the commodities and services required in producing transportation services conform to general price movements it would seem that current prices should be brought on the books as far as possible if sacrifice is to be the accepted basis for valuation. In the case of competitive industry, however, it is not original investment which represents the significant figure, for such a basis for valuation assumes that the speculative opportunities and accidents of the actual business situation are eliminated. Has original investment greater significance in the case of public utilities?

To answer this question it is necessary to consider the attitude of the rate-making authorities. It has been the tendency of courts and commissions to restrict the *rate* of net income allowed the public utilities as compared with normal returns in other lines. This is not necessarily unfair discrimination against the utility investor as a "reasonable return" on a railway property need not be the same as in other lines. If the speculative risks were removed, due to governmental control,<sup>1</sup> such properties would normally yield a lower rate than competitive industry. Thus far, however, the policies of the commissions and the attitude of the courts have been somewhat in the direction of infringing upon the rights of the investor. Insistence upon original cost as a basis for fair value has worked to the dis-

<sup>1</sup> In taking over the railroads during the present war crisis it is interesting to note that the government has promised the owners an adequate return.

advantage of the investor in this period of rising prices, and this disadvantage has not been compensated for by the elimination of the possibility of loss. To offset this disadvantage intangibles based on interest charges during construction, pioneering losses and other elements have in some cases been allowed.

This situation appears to be unreasonable. It would seem to be a more equitable procedure to take the standpoint of present value and allow a return on this value which would not put the investor in public utilities at a disadvantage as compared with the investor in competitive enterprises involving the same burdens of ownership. The other equitable alternative would be to *guarantee* a fair return to all public utility enterprises. This would seem out of the question, however, without actual government ownership or a very complete control; for if rates were high enough to yield a fair return to all enterprises the public might be paying for gross inefficiency and poor business judgment in some cases.

The merely nominal significance of original cost in certain cases is emphasized by the fact of depreciation. Allowance for depreciation must of course be made in determining a fair property value for rate-making purposes. The public should not be required to pay a rate on capital returned to the investor. It would therefore seem to be of particular importance that depreciation be carefully recorded in the accounts of public utility enterprises. The use of the replacement policy of accounting for depreciation tends to obscure the situation here. In a railroad enterprise it is of course impossible to keep all the items of property in the original condition. Every item is gradually becoming worthless from the time it is first put into service until retirement. The property as a whole, accordingly, may not be at one hundred per cent value condition although kept at a high point of efficiency by repairs and renewals. If the repairs and replacement policy of charging depreciation is followed, the books may show a property value equal to one hundred per cent of the investment although the present value is but ninety per cent of cost new. A rate based on the book value in such a case would seem to be illegitimate, particularly if it means that ten per cent of the investment has been returned to the stockholders as profits.

If reasonable allowance is made for accrued depreciation, however, the real situation is more clearly presented. When a depreciation fund is maintained the difference between the original cost and the depreciated value is in this fund. It has not been returned to the stockholders, but is earning a rate of return independent of regular operation. When the fund is invested in additions to the property the depreciation on all the property in use deducted from the original cost of such property will leave as a result the actual investment. Or, if the amount of depreciation is returned to the stockholders, the allowance for depreciation is nevertheless made in the accounts and the accounts show the actual *present* investment. Ignoring possible value changes in the other direction there can be no controversy, when this policy of depreciation accounting is properly carried out, regarding the propriety of deducting depreciation to obtain fair value.

It has been attempted in this brief statement only to suggest some of the important questions that arise in public utility valuation and rate making. In conclusion the statement made in Chapter XXIV in connection with the discussion of going value should be reiterated. As long as the situation remains in the present state of uncertainty many questions of valuation must be left to the regulating authorities and need not affect the accounting analysis. Accounting which conforms, however, to the natural economic principles operating in the competitive situation can hardly be said to be improper for any case.

## XXXII

### AUDITING

IN a broad sense any examination of the financial records of a business enterprise constitutes an *audit*. The work of the professional accountant consists largely in auditing and in the construction of systems of accounts and underlying records suitable to the needs of particular industries and enterprises. A brief consideration of the auditing side of this broad practical field will be given in this chapter.

#### THE PURPOSES OF AUDITS

An audit may be conducted for the general purpose of testing the clerical accuracy of the bookkeeper's work and the accounting analysis upon which it is based; or it may be undertaken for some more specific end, such as the determination of financial condition, the detection of fraud, the determination of rights at dissolution, etc.

A large number of corporate managements feel obliged to have their records audited regularly to give authenticity to the statements issued to the stockholders and public. The annual report in such a case has a certificate from the auditing accountants appended, declaring the condition of the company to be as represented. Too often in the past such audits have been only perfunctory and hence have had little or no real value. As the accounting profession becomes more highly organized, however, it is coming to be recognized that a certificate of audit from a reputable accounting firm carries considerable weight with the stockholders and others interested.

A company may have its books audited in order to present a verified statement to actual or prospective creditors as to

solvency conditions. In making loans banks often require such certified statements. In the case of single-proprietorships and partnerships, where the books are often very improperly kept, the owners find it necessary to call in the professional auditor at intervals to prepare statements of income and financial condition. Further, the auditor, or cost expert, is often called upon to determine costs and furnish information concerning specific problems of management.

Frequently an audit, or investigation, will be initiated by a group of stockholders or other interested parties if for any reason it is suspected that the books are improperly kept, or if the statements presented by the company in its reports do not show sufficient information on some particular point. A dispute between the minority and majority stockholders of a railroad company furnishes an illustration of an audit conducted in the interest of a particular group of investors. In this case the majority stockholders were represented by a holding company. The holding company wished to purchase the equity of the minority stockholders in the subsidiary line. The question arose as to what should be the purchase price of this stock. An extensive examination of the records in this case revealed the fact that the actual value of the stock was considerably above the current market price per share. The holding company, owning a majority interest, had had active financial control of the enterprise and it had been the policy of the parent company to use the subsidiary line as a feeder to its main properties. The income on the investment in the smaller road had been obtained primarily from the added traffic derived from the control of this road, rather than from dividends on the stock held. Consequently the controlling interest had had little object in declaring large dividends. It was shown further that it had been the policy of the management to understate net revenue by charging improvements to expense, and thereby creating secret reserves. These facts had resulted in building up the proprietary equity in the business to an extent not reflected on the stock market or in the accounts. The investigation resulted in the sale of the minority stock on a more equitable basis.

The following case presents a somewhat similar situation. In the case of a certain corporation an agreement was entered

into between the preferred and common stockholders at the time of organization which provided that the preferred stock should have exclusive voting privileges until five consecutive annual dividends of seven per cent were paid on that stock. During ten years, although there had been a favorable showing of gross revenue throughout this period, net revenue was not sufficient to pay the dividends required for the consummation of the above agreement. A group of common stockholders instituted an investigation of the company's accounting methods to determine whether or not net revenue had been correctly stated. In this case also it was found that net revenue had been understated through errors in accounting analysis. Sinking fund installments, and many items of new construction in addition to actual depreciation, had been charged to the expense accounts. Had these amounts been properly charged net revenue would have been sufficient to allow the payment of seven per cent on the preferred stock each year. Thus the common stockholders had been prevented, through errors in accounting judgment, from exercising their rightful control of the business for a period of five years.

Outside interests often desire to have the financial records of a business examined. The purposes of such examinations are varied, and many peculiar problems present themselves in specific cases. The following case furnishes an illustration. In a certain town both a municipal enterprise and a private concern were furnishing electric light and power. The municipal company (which was also the city water company) was cutting prices for electricity far below cost to the private concern. The latter company had reason to believe that the municipal enterprise was not allocating costs properly between the water and light departments. An audit of the municipal company's books which was finally instituted discovered that the water rates were covering a considerable portion of the expense properly assignable to the production of light.

The state and federal governments are responsible for a large number of examinations. The books of banking institutions are regularly examined by government auditors. Such audits are undertaken primarily to prevent embezzlements and other improper use of the depositors' funds. „Frequent failures due to

peculations covering a period of years show that these examinations are not always sufficiently thorough; but there can be little doubt that such regulation in general has a salutary effect upon banking practice.

In the case of the railroads the Interstate Commerce Commission has the power to examine the books of an enterprise under its jurisdiction at any time. In many states the public utilities commissions have similar powers. The following case illustrates a type of problem which frequently presents itself to the state commissions. A power company petitioned a certain commission for permission to issue \$10,000,000 in capital stock. An appraisal showed the value of the physical property to be \$7,000,000 but the company argued that a going value of \$3,000,000 existed because of early losses. Assuming the legitimacy of such an intangible, the task for the auditors in this case would be the examination of the financial records covering the period in question in order to determine the amount of net revenue or loss for each year.

The recent federal tax legislation has forced a recognition of the importance of proper accounting. Many firms and corporations are requiring the assistance of professional accountants in preparing income and balance sheets to be used as a basis for reporting tax returns. Tax laws, moreover, do not always conform to consistent accounting principles, and some adjustments may be necessary even if the accounts are kept on an entirely rational basis for private purposes. The charging of allowances for proprietors' salaries to expense, referred to in Chapter XI, is an illustration of such an adjustment.

Audits are often necessary at times of organization, reorganization, merger, dissolution, etc. In the case of insolvency experts are usually called in to prepare schedules of assets and liabilities and a showing of the proprietary balance and its distribution if there is any such balance. Also in connection with the administration of estates and similar matters certified statements from auditors are often required.

It should be evident from this brief statement that the field of auditing is a broad one and might be said to include the analytical or interpretative side of professional accountancy.



## THE ESSENTIALS OF AUDITING

The illustrative cases mentioned above emphasize the fact that although one of the purposes of the general audit is the verification of the clerical work it is a much more important function of the auditor to discover whether or not sound accounting principles have been observed. The checking of postings and column totals is not a particularly illuminating process. In fact, column totals may check, debits may equal credits, and still flagrant violations of accounting principles may exist. If repair outlays, for example, are charged to property instead of to expense, the accuracy of the clerical work may be unquestioned, but nevertheless a serious accounting error has occurred which affects one of the most important figures shown by the records, net revenue.

This does not mean that the auditor should neglect numerical and other clerical inaccuracies. Such errors are serious from a certain viewpoint. The bookkeeper, for example, may carelessly credit the wrong customer's account with the amount of a payment, or may credit a creditor's account instead of an account receivable, or may even omit one side of the entry entirely; and any such error might cause considerable confusion and a misunderstanding between the parties to the transaction improperly recorded. But all such clerical mistakes tend to be more or less self-corrective, and their location and adjustment is a secondary part of the auditor's work.

It has been implied in the foregoing discussion that it is the task of the auditor to make examinations of financial records. The point should be emphasized, however, that an important purpose of an audit is the discovery of facts not recorded. There may be no record of accrued liabilities, for example, or certain revenue items may be omitted. Further, some of the assets owned may not appear in the accounts. It is the function of the auditor to locate all such items and include them in the statements prepared so that a true picture of the financial condition of the enterprise under audit may be presented.

Contingent assets and liabilities are important matters for the auditor to consider. Contingencies are not accounting transactions in the ordinary sense and need not be entered in the

regular financial accounts; for obviously it is the function of the accounts to present a record of actual transactions and value changes and not of anticipated occurrences. But an ordinary balance sheet statement of assets and equities is not an entirely satisfactory statement for the prospective creditor or investor. The probable future financial condition of the enterprise is a matter of importance; and contingent assets and liabilities, if they represent definite possibilities, have a bearing upon this condition. Indorsed notes, guarantees in connection with the sale of goods, pending damage claims, guarantees of principal or income in connection with the security issues of subsidiary companies — these are common examples of contingent liabilities. Possible stock assessments, claims against railroad companies or other disputed rights, are examples of contingent assets. A satisfactory auditor's report will include a statement of all such items.

While it may not be reasonable to consider the auditor a valuation expert, nevertheless he must pass upon and test valuations. In connection with securities, accounts receivable, patents, goodwill, and other intangibles, it is usually the auditor, after consultation with the manager or owner, who sets the actual valuations. Further, he must be familiar with depreciation rates and methods of taking inventory. Above all the auditor should take a conservative position in regard to all valuation. It is a natural tendency of business managements to overstate values in their anxiety to make a favorable showing. The development of income and excess profit taxes has offset this tendency to some extent, but it still exists. This does not mean that the auditor need adopt an illogical policy. Rules for valuations should be *logically formulated* but *conservatively applied*. In view of the present prejudice in favor of an illogical basis for valuations (see Chapter XX) it may be wise for an auditor to follow prevailing practice in presenting the audited balance sheet proper. By means of footnotes and supplementary statements, however, the auditor may make clear to all interested the actual financial condition of the enterprise as he finds it. If the auditor's report does not present actual condition in some way such a report cannot serve the purposes intended.

As was explained in the preceding section an audit is usually conducted for some definite purpose. The auditor's report, accordingly, should be prepared in such a way as to throw the greatest possible light upon the particular problem involved. A balance sheet of a certain company, for example, prepared for a banker who is considering making a short-term loan to the company, should show the liquid assets as the first group of asset items; and the current liabilities should be similarly segregated in a prominent position so that a comparison between the two groups can easily be made. The stockholder, on the other hand, may be more interested in the fixed assets and the amount of the proprietary equity. If this is the case these facts should be clearly set forth. Accurate classification in view of a particular purpose is an important phase of auditing. If there are several interests involved the auditor may prepare a whole sheaf of income and balance sheets, each of which statements stresses a certain aspect of the business, and certain relations between the financial data involved. (See the chapters on statements.) This does not at all mean, however, that the professional accountant should twist or misconstrue the facts in the interest of a particular client.

Often the auditor has to deal not only with clerical inaccuracies and errors in accounting analysis but also with fraud. The most common fraud is the misappropriation of cash or similar assets. It is especially because of this fact that an auditor should exercise tact and discretion in his relations with the officials and employees of the enterprise whose books are being examined. It is his duty to obtain the facts even if these facts are not to the advantage of his client. When embezzlements are made by an officer or employee who has access to the records it is quite possible that the theft may be covered up so ingeniously as to make detection very difficult. The manipulation of sales and accounts receivable figures is the means most commonly employed to eliminate the evidence of defalcations. Misappropriations are particularly hard to detect in the case of small businesses where a single officer or employee has access to or control over all the records. The system of internal check in force in large offices tends to prevent such occurrences. The various methods of detecting errors and fraud are a part of the

technique of auditing, however, and a consideration of these matters is beyond the scope of this discussion.

It should be evident from this brief statement of the nature and purposes of auditing that the successful auditor needs a thorough training in theory and an extensive practical accounting experience. He needs an exhaustive knowledge of accounting principles since the examination of the financial statistics of a modern business enterprise involves the knowledge of all the accounting principles upon which such records are based and to which they should conform ; and he evidently requires a thorough familiarity with the particular types of records used in various kinds of business such as manufacturing, trading, banking, etc. Each industry — and even each particular enterprise — has its own peculiar accounting problems and requires a more or less unique system of records. A knowledge of the main features of business operation in the various important fields and of the accounting technique suited to these special cases can only be secured in an adequate degree through actual experience.

Again, the work an auditor is called upon to do involves many questions of business law and finance ; and hence a general knowledge of these subjects is invaluable. Finally, the auditor should be able to express his findings with such clearness and simplicity that they may be readily appreciated by any interested parties.



## **APPENDICES**



## A

### THE TREATMENT OF CASH DISCOUNTS

THE cash discount accounts as ordinarily kept have been classed in this text as valuation accounts. The Purchase Discounts account shows the amount by which merchandise or material costs have been overstated, and the Sales Discounts account shows the deduction from the gross sales figure resulting from the allowances made for prompt cash payments. At several points in the preceding pages the nature of discounts has been discussed and the question of the proper location of such items in the summary statements was briefly considered in Chapter IX. While the analysis that has been given is essentially correct the method of making the entries used may be criticized because it fails to recognize *neglected* discounts in the accounts. The common method of making the entries also makes the valuation at which the merchandise or materials purchased is carried in the accounts depend upon whether or not the purchaser takes the discounts offered. This last criticism is not so important as it might seem at first sight because merchandise and raw materials usually pass so rapidly through the business process that these items soon become costs; and it is certainly true that a firm which does not take its discounts has a higher merchandise cost than one which does. The recognition of neglected discounts, however, is a matter of some theoretic importance at least. While it is true that in many cases the amount of cash discounts is relatively unimportant it must be recognized that accounting attempts to present the actual facts as accurately as possible. With this idea in view it may be well to examine an alternative method of treating cash discounts.

A possible method would be to provide special accounts for discounts neglected but none for discounts taken.<sup>1</sup> According

<sup>1</sup> Cf. Cole, *Accounts, Their Construction and Interpretation*, Chapter Twenty-one.



to this method it is more important to know how much has been lost in discounts than how much has been taken; and this fact evidently cannot be determined from the ordinary discount accounts. The fact that a discount has been neglected indicates that the firm is operating with insufficient working capital and is therefore unable to meet its bills promptly. The amount of the neglected discount is in fact an interest payment as was pointed out in Chapter XIV. The firm is paying its creditor interest for carrying the account. Accordingly, since interest is neither a property item nor an expense, but is rather a charge against net revenue, it is obviously incorrect to charge discounts to the merchandise accounts.

According to this method goods purchased are always entered at the *discounted* price. This procedure can best be explained by an illustration. Suppose a firm buys merchandise with a gross price of \$1,000, two per cent off if paid in ten days. The discounted price is then \$980. The entries at the date of purchase would accordingly be:

Merchandise . . . . .	\$980	
Accounts Payable . . . . .		\$ 980

When payment is made, if within ten days, the entries would be:

Accounts Payable . . . . .	\$980	
Cash . . . . .		\$ 980

If the bill were not paid within the specified discount period, however, the entries covering the payment would be as follows:

Accounts Payable . . . . .	\$980	
Neglected Purchase Discounts . . . . .	20	
Cash . . . . .		\$1,000

The Neglected Purchase Discounts account would be closed into Net Revenue (or Expense and Revenue) as is any interest account. By this method merchandise purchases will always be entered at the cash price regardless as to whether prompt payment is made or not. No adjustment of expense is required because of discounts taken, but an interest charge is made for all discounts neglected.

It is sometimes objected to this method that the invoice price should be credited to Accounts Payable at the date of purchase. In other words where alternative terms of settlement are allowed the gross liability should be carried in the accounts. It might be argued against this objection that no real purpose is served by carrying the gross invoice price through the accounts. The actual accounting liability at the date of the transaction is the cash price and this increases only through lapse of time. This situation is not peculiar to accounts payable; the same is true of notes and bonds. If, however, it be desired in the case of accounts payable to adhere to the almost universal custom of listing liabilities in the accounts at face or gross amount the invoice price may be carried in the accounts without changing the results of this method. At the date of purchase, for example, the entries for the above illustration might be:

Merchandise . . . . .	\$ 980	
Purchase Discounts Offered . . . . .	20	
Accounts Payable . . . . .		\$1,000

Purchase Discounts Offered is a valuation account which shows the amount by which the item appearing in Accounts Payable exceeds the actual present liability. At the date of payment if the discount is taken the entries would be:

Accounts Payable . . . . .	\$1,000	
Cash . . . . .		\$ 980
Purchase Discounts Offered . . . . .		20

If the discount were not taken the entries would be:

Accounts Payable . . . . .	\$1,000	
Cash . . . . .		\$1,000

In the case of discounts on sales the same analysis would hold. Here the Neglected Sales Discounts account would show a credit balance which would represent an interest revenue. That is, the customers who failed to meet their bills promptly would be paying interest on their accounts.

While this method of treating purchase and sales discounts

conforms more nearly to correct accounting principles it is very seldom used ; and, as already explained, present practice in this connection accomplishes essentially correct results. It is also somewhat unreasonable, in view of the nature of discount rates, to consider neglected discounts as either income or deductions from income. Further, this method requires an estimate at the end of each accounting period of the amounts of both purchase and sales discounts, applicable to accounts unpaid and not yet due, which will finally be taken ; and the difficulties involved in this procedure are such as to render this method, as a rule, inexpedient.

**B**  
**INTEREST TABLES**

TABLE I

*Amount to which 1 will accumulate in n periods*

$$s = (1 + i)^n$$

n	1½%	1½%	2%	2½%	3%
1	1.012 5000	1.015 0000	1.020 0000	1.025 0000	1.030 0000
2	1.025 1563	1.030 2250	1.040 4000	1.050 6250	1.060 9000
3	1.037 9707	1.045 6784	1.061 2080	1.076 8006	1.092 7270
4	1.050 9453	1.061 3636	1.082 4322	1.103 8129	1.125 5088
5	1.064 0822	1.077 2840	1.104 0808	1.131 4082	1.159 2741
6	1.077 3832	1.093 4433	1.126 1624	1.159 6934	1.194 0523
7	1.090 8505	1.109 8449	1.148 6857	1.188 6858	1.229 8739
8	1.104 4861	1.126 4926	1.171 6594	1.218 4029	1.266 7701
9	1.118 2922	1.143 3900	1.195 0926	1.248 8630	1.304 7732
10	1.132 2708	1.160 5408	1.218 9944	1.280 0845	1.343 9164
11	1.146 4242	1.177 9489	1.243 3743	1.312 0867	1.384 2339
12	1.160 7545	1.195 6182	1.268 2418	1.344 8888	1.425 7609
13	1.175 2639	1.213 5524	1.293 6066	1.378 5110	1.468 5337
14	1.189 9547	1.231 7557	1.319 4788	1.412 9738	1.512 5897
15	1.204 8292	1.250 2321	1.345 8683	1.448 2982	1.557 9674
16	1.219 8895	1.268 9855	1.372 7857	1.484 5056	1.604 7064
17	1.235 1382	1.288 0203	1.400 2414	1.521 6183	1.652 8476
18	1.250 5774	1.307 3406	1.428 2463	1.559 6587	1.702 4331
19	1.266 2096	1.326 9597	1.456 8112	1.598 6502	1.753 5061
20	1.282 0372	1.346 8550	1.485 9474	1.638 6164	1.806 1112
21	1.298 0027	1.367 0578	1.515 6663	1.679 5819	1.860 2946
22	1.314 2885	1.387 5637	1.545 9797	1.721 5714	1.916 1034
23	1.330 7171	1.408 3771	1.576 8993	1.764 6107	1.973 5865
24	1.347 3511	1.429 5028	1.608 4373	1.808 7260	2.032 7941
25	1.364 1929	1.450 9454	1.640 6060	1.853 9441	2.093 7780
26	1.381 2454	1.472 7095	1.673 4181	1.900 2927	2.156 5913
27	1.398 5109	1.494 8002	1.706 8865	1.947 8900	2.221 2890
28	1.415 9923	1.517 2222	1.741 0242	1.996 4950	2.287 9277
29	1.433 6922	1.539 9805	1.775 8447	2.046 4074	2.356 5655
30	1.451 6134	1.563 0802	1.811 3616	2.097 5676	2.427 2625
31	1.469 7585	1.586 5264	1.847 5888	2.150 0068	2.500 0803
32	1.488 1305	1.610 3243	1.884 5406	2.203 7569	2.575 0828
33	1.506 7321	1.634 4792	1.922 2314	2.258 8509	2.652 3352
34	1.525 5663	1.658 9964	1.960 6760	2.315 3221	2.731 9053
35	1.544 6359	1.683 8813	1.999 8806	2.373 2052	2.813 8625
36	1.563 9438	1.709 1395	2.039 8873	2.432 5353	2.898 2783
37	1.583 4931	1.734 7766	2.080 6851	2.493 3487	2.985 2267
38	1.603 2868	1.760 7983	2.122 2988	2.555 6824	3.074 7835
39	1.623 3279	1.787 2102	2.164 7448	2.619 5745	3.167 0270
40	1.643 6195	1.814 0184	2.208 0397	2.685 0638	3.262 0378
41	1.664 1647	1.841 2287	2.252 2005	2.752 1904	3.359 8989
42	1.684 9668	1.868 8471	2.297 2445	2.820 9952	3.460 6959
43	1.706 0289	1.896 8798	2.343 1894	2.891 5201	3.564 5168
44	1.727 3542	1.925 3330	2.390 0531	2.963 8081	3.671 4523
45	1.748 9461	1.954 2130	2.437 8542	3.037 9033	3.781 5958
46	1.770 8080	1.983 5262	2.486 6113	3.113 8509	3.895 0437
47	1.792 9431	2.013 2791	2.536 3435	3.191 6971	4.011 8950
48	1.815 3549	2.043 4783	2.587 0704	3.271 4896	4.132 2519
49	1.838 0468	2.074 1305	2.638 8118	3.353 2768	4.256 2194
50	1.861 0224	2.105 2424	2.691 5880	3.437 1087	4.383 9060

TABLE I

*Amount to which 1 will accumulate in n periods*

$$s = (1 + i)^n$$

3½%	4%	4½%	5%	6%	n
1.035 0000	1.040 0000	1.045 0000	1.050 0000	1.060 0000	1
1.071 2250	1.081 6000	1.092 0250	1.102 5000	1.123 6000	2
1.108 7179	1.124 8640	1.141 1661	1.157 6250	1.191 0160	3
1.147 5230	1.169 8586	1.192 5186	1.215 5063	1.262 4770	4
1.187 6863	1.216 6529	1.246 1819	1.276 2816	1.338 2256	5
1.229 2553	1.265 3190	1.302 2601	1.340 0956	1.418 5191	6
1.272 2793	1.315 9318	1.360 8618	1.407 1004	1.503 6303	7
1.316 8090	1.368 5091	1.422 1006	1.477 4554	1.593 8481	8
1.362 8974	1.423 3118	1.486 0951	1.551 3282	1.689 4790	9
1.410 5988	1.480 2443	1.552 9694	1.628 8946	1.790 8477	10
1.459 9697	1.539 4541	1.622 8530	1.710 3394	1.898 2986	11
1.511 0687	1.601 0322	1.695 8814	1.795 8563	2.012 1965	12
1.563 9561	1.665 0735	1.772 1961	1.885 6491	2.132 9283	13
1.618 6945	1.731 6764	1.851 9449	1.979 9316	2.260 9040	14
1.675 3488	1.800 9435	1.935 2824	2.078 9282	2.396 5582	15
1.733 9860	1.872 9812	2.022 3702	2.182 8746	2.540 3517	16
1.794 6756	1.947 9005	2.113 3768	2.292 0183	2.692 7728	17
1.857 4892	2.025 8165	2.208 4788	2.406 6192	2.854 3392	18
1.922 5013	2.106 8492	2.307 8603	2.526 9502	3.025 5995	19
1.989 7889	2.191 1231	2.411 7140	2.653 2977	3.207 1355	20
2.059 4315	2.278 7681	2.520 2412	2.785 9626	3.399 5636	21
2.131 5116	2.369 9188	2.633 6520	2.925 2607	3.603 5374	22
2.206 1145	2.464 7155	2.752 1663	3.071 5238	3.819 7497	23
2.283 3285	2.563 3042	2.876 0138	3.225 0999	4.048 9346	24
2.363 2450	2.665 8363	3.005 4345	3.386 3549	4.291 8707	25
2.445 9586	2.772 4698	3.140 6790	3.555 6727	4.549 3830	26
2.531 5671	2.883 3686	3.282 0096	3.733 4563	4.822 3459	27
2.620 1720	2.998 7033	3.429 7000	3.920 1291	5.111 6867	28
2.711 8780	3.118 6515	3.584 0365	4.116 1356	5.418 3879	29
2.806 7937	3.243 3975	3.745 3181	4.321 9424	5.743 4912	30
2.905 0315	3.373 1334	3.913 8575	4.538 0395	6.088 1006	31
3.006 7076	3.508 0587	4.089 9810	4.764 9415	6.453 3867	32
3.111 9424	3.648 3811	4.274 0302	5.003 1885	6.840 5899	33
3.220 8603	3.794 3163	4.466 3615	5.253 3480	7.251 0253	34
3.333 5904	3.946 0800	4.667 3478	5.516 0154	7.686 0868	35
3.450 2661	4.103 9326	4.877 3785	5.791 8161	8.147 2520	36
3.571 0254	4.268 0899	5.096 8605	6.081 4069	8.636 0871	37
3.696 0113	4.438 8135	5.326 2192	6.385 4773	9.154 2523	38
3.825 3717	4.616 3660	5.565 8991	6.704 7512	9.703 5975	39
3.959 2597	4.801 0206	5.816 3645	7.039 9887	10.285 7119	40
4.097 8338	4.993 0615	6.078 1009	7.391 9881	10.902 8610	41
4.241 2580	5.192 7830	6.351 6155	7.761 5876	11.557 0327	42
4.389 7020	5.400 4953	6.637 4382	8.149 6669	12.250 4546	43
4.543 3416	5.616 5151	6.936 1229	8.557 1503	12.985 4819	44
4.702 3586	5.841 1757	7.248 2484	8.985 0078	13.764 6108	45
4.866 9411	6.074 8227	7.574 4196	9.434 2582	14.590 4875	46
5.037 2840	6.317 8156	7.915 2685	9.905 9711	15.465 9167	47
5.213 5890	6.570 5282	8.271 4556	10.401 2696	16.393 8717	48
5.396 0646	6.833 3494	8.643 6711	10.921 3331	17.377 5040	49
5.584 9269	7.106 6833	9.032 6363	11.467 3998	18.420 1543	50

TABLE II  
*Present value of 1 due in n periods*

$$P = \frac{1}{(1 + i)^n}$$

n	1½%	1½%	2%	2½%	3%
1	0.987 6543	0.985 2217	0.980 3922	0.975 6098	0.970 8738
2	0.975 4611	0.970 6617	0.961 1688	0.951 8144	0.942 5959
3	0.963 4183	0.956 3170	0.942 3223	0.928 5994	0.915 1417
4	0.951 5243	0.942 1842	0.923 8454	0.905 0506	0.888 4870
5	0.939 7771	0.928 2603	0.905 7308	0.883 8543	0.862 6088
6	0.928 1749	0.914 5422	0.887 0714	0.862 2060	0.837 4843
7	0.916 7159	0.901 0268	0.870 5602	0.841 2652	0.813 0915
8	0.905 3985	0.887 7111	0.853 4904	0.820 7466	0.789 4092
9	0.894 2207	0.874 5922	0.836 7553	0.800 7284	0.766 4167
10	0.883 1809	0.861 6672	0.820 3483	0.781 1984	0.744 0939
11	0.872 2775	0.848 9332	0.804 2630	0.762 1448	0.722 4213
12	0.861 5086	0.836 3374	0.788 4932	0.743 5559	0.701 3799
13	0.850 8727	0.824 0270	0.773 0325	0.725 4204	0.680 9513
14	0.840 3681	0.811 8493	0.757 8750	0.707 7272	0.661 1178
15	0.829 9932	0.799 8515	0.743 0147	0.690 4656	0.641 8619
16	0.819 7463	0.788 0310	0.728 4458	0.673 6249	0.623 1669
17	0.809 6260	0.776 3853	0.714 1626	0.657 1951	0.605 0164
18	0.799 6306	0.764 9116	0.700 1594	0.641 1650	0.587 3046
19	0.789 7587	0.756 6075	0.686 4308	0.625 5277	0.570 2860
20	0.780 0085	0.742 4704	0.672 0713	0.610 2700	0.553 6758
21	0.770 3788	0.731 4680	0.659 7758	0.595 3863	0.537 5493
22	0.760 8680	0.720 6876	0.646 8390	0.580 8647	0.521 8925
23	0.751 4745	0.710 0371	0.634 1559	0.566 6972	0.506 6917
24	0.742 1971	0.699 5439	0.621 7215	0.552 8754	0.491 9337
25	0.733 0341	0.689 2058	0.609 5309	0.539 3906	0.477 6056
26	0.723 9843	0.679 0205	0.597 5793	0.526 2347	0.463 6947
27	0.715 0463	0.668 9857	0.585 8620	0.513 3997	0.450 1891
28	0.706 2185	0.659 0993	0.574 3746	0.500 8778	0.437 0768
29	0.697 4998	0.649 3589	0.563 1123	0.488 6613	0.424 3464
30	0.688 8887	0.639 7624	0.552 0709	0.476 7427	0.411 9868
31	0.680 3839	0.630 3078	0.541 2460	0.465 1148	0.399 9871
32	0.671 9841	0.620 9929	0.530 6333	0.453 7705	0.388 3370
33	0.663 6880	0.611 8157	0.520 2287	0.442 7030	0.377 0262
34	0.655 4943	0.602 7741	0.510 0282	0.431 9053	0.366 0449
35	0.647 4018	0.593 8661	0.500 0276	0.421 3711	0.355 3834
36	0.639 4092	0.585 0897	0.490 2232	0.411 0937	0.345 0324
37	0.631 5152	0.576 4431	0.480 6109	0.401 0670	0.334 9829
38	0.623 7187	0.567 9242	0.471 1872	0.391 2849	0.325 2262
39	0.616 0185	0.559 5313	0.461 9482	0.381 7414	0.315 7535
40	0.608 4133	0.551 2623	0.452 8904	0.372 4306	0.306 5568
41	0.600 9021	0.543 1156	0.444 0102	0.363 3469	0.297 6280
42	0.593 4835	0.535 0893	0.435 3041	0.354 4848	0.288 9592
43	0.586 1566	0.527 1815	0.426 7688	0.345 8389	0.280 5429
44	0.578 9201	0.519 3907	0.418 4007	0.337 4038	0.272 3718
45	0.571 7729	0.511 7149	0.410 1968	0.329 1744	0.264 4386
46	0.564 7140	0.504 1527	0.402 1537	0.321 1458	0.256 7365
47	0.557 7422	0.496 7021	0.394 2684	0.313 3129	0.249 2588
48	0.550 8565	0.489 3617	0.386 5376	0.305 6712	0.241 9988
49	0.544 0558	0.482 1298	0.378 9584	0.298 2158	0.234 9593
50	0.537 3391	0.475 0047	0.371 5279	0.290 9422	0.228 0171

TABLE II  
Present value of 1 due in  $n$  periods

$$P = \frac{1}{(1+i)^n}$$

3½%	4%	4½%	5%	6%	n
0.966 1836	0.961 5385	0.956 9378	0.952 3810	0.943 3962	1
0.933 5107	0.924 5562	0.915 7300	0.907 0295	0.889 9964	2
0.901 9427	0.888 9964	0.876 2966	0.863 8376	0.839 6193	3
0.871 4422	0.854 8042	0.838 5613	0.822 7025	0.792 0937	4
0.841 9732	0.821 9271	0.802 4510	0.783 5262	0.747 2582	5
0.813 5006	0.790 3145	0.767 8957	0.746 2154	0.704 9605	6
0.785 9910	0.759 9178	0.734 8285	0.710 6813	0.665 0571	7
0.759 4116	0.730 6902	0.703 1851	0.676 8394	0.627 4124	8
0.733 7310	0.702 5867	0.672 9044	0.644 6089	0.591 8985	9
0.708 9188	0.675 5642	0.643 9277	0.613 9133	0.558 3948	10
0.684 9457	0.649 5809	0.616 1987	0.584 6793	0.526 7875	11
0.661 7833	0.624 5970	0.589 6639	0.556 8374	0.496 9694	12
0.639 4042	0.600 5741	0.564 2716	0.530 3214	0.468 8390	13
0.617 7818	0.577 4751	0.539 9729	0.505 0680	0.442 3010	14
0.596 8906	0.555 2645	0.516 7204	0.481 0171	0.417 2651	15
0.576 7050	0.533 0082	0.494 4693	0.458 1115	0.393 6463	16
0.557 2038	0.513 3732	0.473 1764	0.436 3967	0.371 3644	17
0.538 3611	0.493 6281	0.452 8004	0.415 5207	0.350 3438	18
0.520 1557	0.474 6424	0.433 3018	0.395 7340	0.330 5130	19
0.502 5659	0.456 3860	0.414 6429	0.376 8895	0.311 8047	20
0.485 5709	0.438 8336	0.396 7874	0.358 9424	0.294 1554	21
0.469 1506	0.421 9554	0.379 7009	0.341 8499	0.277 5051	22
0.453 2856	0.405 7263	0.363 3501	0.325 5713	0.261 7973	23
0.437 9571	0.390 1215	0.347 7935	0.310 0670	0.246 9785	24
0.423 1470	0.375 1168	0.332 7306	0.295 3028	0.232 9986	25
0.408 8377	0.360 6892	0.318 4025	0.281 2407	0.219 8100	26
0.395 0122	0.346 8166	0.304 6914	0.267 8483	0.207 3679	27
0.381 6543	0.333 4775	0.291 5707	0.255 0936	0.195 6301	28
0.368 7482	0.320 6514	0.279 0150	0.242 9463	0.184 5567	29
0.356 2784	0.308 3187	0.267 0000	0.231 3774	0.174 1101	30
0.344 2303	0.296 4603	0.255 5024	0.220 3595	0.164 2548	31
0.332 5897	0.285 0579	0.244 4999	0.209 8662	0.154 9574	32
0.321 3427	0.274 0942	0.233 0712	0.199 8725	0.146 1862	33
0.310 4761	0.263 5521	0.223 8959	0.190 3548	0.137 9115	34
0.299 0709	0.253 4155	0.214 2544	0.181 2903	0.130 1052	35
0.289 8327	0.243 6687	0.205 0282	0.172 6574	0.122 7408	36
0.280 9316	0.234 2968	0.196 1902	0.164 4356	0.115 7932	37
0.270 5610	0.225 2854	0.187 7504	0.156 0054	0.109 2389	38
0.261 4125	0.216 6206	0.179 6655	0.149 1480	0.103 0555	39
0.252 5725	0.208 2890	0.171 9287	0.142 0457	0.097 2222	40
0.244 0314	0.200 2779	0.164 5251	0.135 2816	0.091 7190	41
0.235 7791	0.192 5749	0.157 4403	0.128 8396	0.086 5274	42
0.227 8059	0.185 1682	0.150 6605	0.122 7044	0.081 6296	43
0.220 1023	0.178 0463	0.144 1728	0.116 8613	0.077 0091	44
0.212 6592	0.171 1084	0.137 9644	0.111 2965	0.072 6501	45
0.205 4679	0.164 6139	0.132 0233	0.105 9967	0.068 5378	46
0.198 5197	0.158 2826	0.126 3381	0.100 9492	0.064 6583	47
0.191 8065	0.152 1948	0.120 8977	0.096 1421	0.060 9984	48
0.185 3202	0.146 3411	0.115 6916	0.091 5639	0.057 5457	49
0.179 0534	0.140 7126	0.110 7096	0.087 2037	0.054 2884	50



TABLE III

*Sum to which an annuity of 1 per year will accumulate in n periods*

$$s_n = \frac{(1+i)^n - 1}{i}$$

n	1½%	1½%	2%	2½%	3%
1	1.000 0000	1.000 0000	1.000 0000	1.000 0000	1.000 0000
2	2.012 5000	2.015 0000	2.020 0000	2.025 0000	2.030 0000
3	3.037 6562	3.045 2250	3.060 4000	3.075 6250	3.090 9000
4	4.075 6269	4.090 0034	4.121 6080	4.152 5156	4.183 6270
5	5.126 5723	5.152 2669	5.204 0402	5.256 3285	5.309 1358
6	6.190 6544	6.229 5509	6.308 1210	6.387 7367	6.468 4099
7	7.268 0376	7.322 9942	7.434 2834	7.547 4301	7.662 4022
8	8.358 8881	8.432 8391	8.582 0691	8.736 1159	8.892 3360
9	9.463 3742	9.559 3317	9.754 6284	9.954 5188	10.159 1061
10	10.581 6664	10.702 7217	10.949 7210	11.203 3818	11.463 8793
11	11.713 9372	11.863 2625	12.168 7154	12.483 4663	12.807 7957
12	12.860 3614	13.041 2114	13.412 0897	13.795 5530	14.192 0296
13	14.021 1159	14.236 8296	14.680 3315	15.140 4418	15.617 7904
14	15.196 3799	15.450 3820	15.973 9382	16.518 9528	17.086 3242
15	16.386 3346	16.682 1378	17.293 4160	17.931 9267	18.598 9139
16	17.591 1038	17.932 3698	18.639 2853	19.380 2248	20.156 8813
17	18.811 0534	19.201 3554	20.012 0710	20.864 7304	21.761 5877
18	20.046 1915	20.489 3757	21.412 3124	22.386 3487	23.414 4354
19	21.296 7689	21.796 7164	22.840 5586	23.946 0074	25.116 8684
20	22.562 9785	23.123 6671	24.297 3698	25.544 6576	26.870 3745
21	23.845 0158	24.470 5221	25.783 3172	27.183 2741	28.676 4857
22	25.143 0785	25.837 5799	27.298 9835	28.862 8559	30.536 7803
23	26.457 3669	27.225 1436	28.844 9632	30.584 4273	32.452 8837
24	27.788 0840	28.633 5208	30.421 8625	32.349 0380	34.426 4702
25	29.135 4351	30.063 0236	32.030 2097	34.157 7639	36.459 2643
26	30.499 6280	31.513 9690	33.670 9057	36.011 7080	38.553 0423
27	31.880 8734	32.986 6785	35.344 3238	37.912 0007	40.709 6335
28	33.279 3843	34.481 4787	37.051 2103	39.859 8007	42.930 9225
29	34.695 3766	35.998 7009	38.792 2345	41.856 2958	45.218 8502
30	36.129 0688	37.538 6814	40.568 0792	43.902 7032	47.575 4157
31	37.580 6822	39.101 7616	42.379 4408	46.000 2707	50.002 6782
32	39.050 4407	40.688 2880	44.227 0296	48.150 2775	52.502 7585
33	40.538 5712	42.298 6123	46.111 5702	50.354 0344	55.077 8413
34	42.045 3033	43.933 0915	48.033 8016	52.612 8853	57.730 1765
35	43.570 8696	45.592 0879	49.994 4776	54.928 2074	60.462 0818
36	45.115 5955	47.275 9692	51.994 3672	57.301 4126	63.275 9443
37	46.679 4493	48.985 1087	54.034 2545	59.733 9479	66.174 2226
38	48.262 9424	50.719 8854	56.114 9396	62.227 2966	69.159 4493
39	49.866 2292	52.480 6837	58.237 2384	64.782 9791	72.234 2328
40	51.489 5571	54.267 8939	60.401 9832	67.402 5535	75.401 2597
41	53.133 1765	56.081 9123	62.610 0228	70.087 6174	78.663 2975
42	54.797 3412	57.923 1410	64.862 2233	72.839 8078	82.023 1965
43	56.482 3080	59.791 9881	67.159 4678	75.660 8030	85.483 8923
44	58.188 3369	61.688 8679	69.502 6571	78.552 3231	89.048 4091
45	59.915 6911	63.614 2010	71.892 7103	81.516 1312	92.719 8614
46	61.664 6372	65.568 4140	74.330 5645	84.554 0344	96.501 4572
47	63.435 4452	67.551 9402	76.817 1758	87.667 8853	100.306 5009
48	65.228 3884	69.559 2193	79.353 5193	90.859 5824	104.408 3960
49	67.043 7431	71.608 6976	81.940 5897	94.131 0720	108.540 6479
50	68.881 7899	73.682 8280	84.579 4015	97.484 3288	112.706 8673

TABLE III

Sum to which an annuity of 1 per year will accumulate in  $n$  periods

$$s_n = \frac{(1+i)^n - 1}{i}$$

$3\frac{1}{2}\%$	4%	$4\frac{1}{2}\%$	5%	6%	$n$
1.000 0000	1.000 0000	1.000 0000	1.000 0000	1.000 0000	1
2.035 0000	2.040 0000	2.045 0000	2.050 0000	2.060 0000	2
3.106 2250	3.121 6000	3.137 0250	3.152 5000	3.183 6000	3
4.214 9429	4.246 4640	4.278 1911	4.310 1250	4.374 6160	4
5.362 4659	5.416 3226	5.470 7097	5.525 6312	5.637 0930	5
6.550 1522	6.632 9755	6.716 8917	6.801 9128	6.975 3185	6
7.779 4075	7.898 2945	8.019 1518	8.142 0085	8.393 8376	7
9.051 6868	9.214 2263	9.380 0136	9.549 1089	9.897 4679	8
10.368 4958	10.582 7953	10.802 1142	11.026 5643	11.491 3160	9
11.731 3932	12.006 1071	12.288 2094	12.577 8925	13.180 7949	10
13.141 9919	13.486 3514	13.841 1788	14.206 7872	14.971 6426	11
14.601 9616	15.025 8055	15.464 0318	15.917 1265	16.869 9412	12
16.113 0303	16.626 8377	17.159 9132	17.712 9828	18.882 1377	13
17.676 9864	18.291 9112	18.932 0194	19.598 6320	21.015 0659	14
19.295 6809	20.023 5876	20.784 0543	21.578 5036	23.275 9699	15
20.971 0297	21.824 5311	22.719 3367	23.657 4918	25.672 5281	16
22.705 0157	23.697 5124	24.741 7069	25.840 3664	28.212 8798	17
24.499 6013	25.645 4129	26.855 0837	28.132 3847	30.905 6525	18
26.357 1805	27.671 2294	29.063 5625	30.539 0039	33.759 9917	19
28.279 6818	29.778 0786	31.371 4228	33.065 9541	36.785 5912	20
30.269 4707	31.969 2017	33.783 1368	35.719 2518	39.992 7267	21
32.328 9021	34.247 9698	36.303 3780	38.505 2144	43.392 2903	22
34.460 4137	36.617 8886	38.937 0300	41.430 4751	46.995 8277	23
36.666 5282	39.082 6041	41.689 1963	44.501 9989	50.815 5774	24
38.949 8567	41.645 9083	44.565 2101	47.727 0988	54.864 5120	25
41.313 1017	44.311 7446	47.570 6446	51.113 4538	59.156 3827	26
43.759 0602	47.084 2144	50.711 3236	54.669 1264	63.705 7657	27
46.290 6273	49.967 5830	53.993 3332	58.402 5828	68.528 1116	28
48.910 7993	52.966 2863	57.423 0332	62.322 7119	73.639 7983	29
51.622 6773	56.084 9377	61.007 0697	66.438 8475	79.058 1862	30
54.429 4710	59.328 3353	64.752 3878	70.760 7899	84.801 6774	31
57.334 5025	62.701 4687	68.666 2452	75.298 8294	90.889 7780	32
60.341 2101	66.209 5274	72.756 2263	80.063 7708	97.343 1647	33
63.453 1524	69.857 9085	77.030 2565	85.066 9594	104.183 7546	34
66.674 0127	73.652 2249	81.496 6180	90.320 3074	111.434 7799	35
70.007 6632	77.598 3138	86.163 9638	95.836 3227	119.120 8667	36
73.457 8693	81.702 2464	91.041 3443	101.628 1389	127.268 1187	37
77.028 8947	85.970 3363	96.138 2048	107.709 5458	135.904 2058	38
80.724 9060	90.409 1497	101.464 4240	114.095 0231	145.058 4581	39
84.550 2777	95.025 5157	107.030 3231	120.799 7742	154.761 9656	40
88.509 5375	99.826 5363	112.846 6876	127.839 7630	165.047 6836	41
92.607 3713	104.819 5978	118.924 7885	135.231 7511	175.950 5446	42
96.848 6293	110.012 3817	125.276 4040	142.993 3387	187.507 5772	43
101.238 3313	115.412 8770	131.913 8422	151.143 0056	199.758 0319	44
105.781 6729	121.029 3920	138.849 9651	159.700 1559	212.743 5138	45
110.484 0314	126.870 5677	146.098 2135	168.685 1037	226.508 1246	46
115.350 9725	132.945 3904	153.672 6331	178.119 4218	241.008 6121	47
120.388 2566	139.203 2060	161.587 9016	188.025 3929	256.564 5288	48
125.601 8456	145.833 7343	169.859 3572	198.426 6626	272.958 4005	49
130.997 9102	152.667 0837	178.503 0283	209.347 9957	290.335 9046	50

TABLE IV

*Present value of an annuity of 1 per year for n periods*

$$a_n = \frac{1 - \frac{1}{(1+i)^n}}{i}$$

n	1½%	1½%	2%	2½%	3%
1	0.987 6543	0.985 2217	0.980 3922	0.975 6098	0.970 8738
2	1.963 1154	1.955 8834	1.941 5609	1.927 4242	1.913 4697
3	2.926 5307	2.912 2004	2.883 8833	2.850 0336	2.828 6114
4	3.878 0580	3.854 3846	3.807 7287	3.761 9742	3.717 0984
5	4.817 8350	4.782 6450	4.713 4595	4.645 8285	4.579 7072
6	5.746 0099	5.697 1872	5.601 4309	5.508 1254	5.417 1914
7	6.662 7258	6.598 2140	6.471 9011	6.349 3906	6.230 2830
8	7.568 1243	7.485 9251	7.325 4814	7.170 1372	7.019 6022
9	8.462 3450	8.360 5173	8.162 2367	7.970 8655	7.786 1080
10	9.345 5259	9.222 1846	8.982 5850	8.752 0039	8.530 2028
11	10.217 8034	10.071 1178	9.786 8480	9.514 2087	9.252 6241
12	11.079 3120	10.907 5052	10.575 3412	10.257 7646	9.954 0040
13	11.930 1847	11.731 5322	11.348 3737	10.983 1850	10.634 9553
14	12.770 5527	12.543 3815	12.106 2488	11.690 9122	11.296 0731
15	13.600 5459	13.343 2330	12.849 2035	12.381 3777	11.937 9351
16	14.420 2923	14.131 2641	13.577 7093	13.055 0027	12.561 1020
17	15.229 9183	14.907 6403	14.291 8719	13.712 1977	13.166 1185
18	16.029 5489	15.672 5609	14.992 0312	14.353 3036	13.753 5131
19	16.819 3076	16.426 1684	15.678 4620	14.978 8013	14.323 7901
20	17.599 3161	17.168 6388	16.351 4333	15.589 1623	14.877 4749
21	18.369 6949	17.900 1367	17.011 2092	16.184 5486	15.415 0241
22	19.130 5629	18.620 8244	17.658 0482	16.765 4132	15.936 9166
23	19.882 0374	19.330 8614	18.292 2041	17.332 1105	16.443 6084
24	20.624 2345	20.030 4054	18.913 9256	17.884 0858	16.935 5421
25	21.357 2686	20.719 6112	19.523 4565	18.424 3764	17.413 1477
26	22.081 2530	21.398 6317	20.121 0358	18.950 6111	17.876 8424
27	22.796 2993	22.067 6175	20.706 8978	19.464 0109	18.327 9315
28	23.502 5178	22.726 7167	21.281 2724	19.964 8887	18.764 1082
29	24.200 0176	23.376 0756	21.844 3847	20.453 5499	19.188 4546
30	24.888 9062	24.015 8380	22.396 4556	20.930 2926	19.600 4413
31	25.569 2901	24.646 1458	22.937 7015	21.395 4074	20.000 4285
32	26.241 2742	25.267 1387	23.468 3348	21.849 1780	20.388 7655
33	26.904 0621	25.878 9544	23.988 5636	22.291 8809	20.765 7918
34	27.560 4564	26.481 7285	24.498 5917	22.723 7863	21.131 8307
35	28.207 8582	27.075 5946	24.998 6193	23.145 1573	21.487 2201
36	28.847 2674	27.660 6843	25.488 8425	23.556 2511	21.832 2525
37	29.478 7826	28.237 1274	25.969 4534	23.957 3181	22.167 2354
38	30.102 5013	28.805 0516	26.440 6406	24.348 6030	22.492 4610
39	30.718 5198	29.364 5829	26.902 5888	24.730 3444	22.808 2151
40	31.326 9332	29.915 8452	27.355 4792	25.102 7750	23.114 7720
41	31.927 8352	30.458 9608	27.799 4895	25.466 1220	23.412 4000
42	32.521 3187	30.994 0500	28.234 7936	25.820 6068	23.701 3592
43	33.107 4753	31.521 2316	28.661 5623	26.166 4457	23.981 9021
44	33.686 3954	32.040 6222	29.070 9631	26.503 8495	24.254 2739
45	34.258 1682	32.552 3372	29.490 1599	26.833 0230	24.518 7125
46	34.822 8822	33.056 4898	29.892 3136	27.154 1696	24.775 4491
47	35.380 6244	33.553 1919	30.286 5820	27.467 4826	25.024 7078
48	35.931 4809	34.042 5536	30.673 1196	27.773 1537	25.266 7666
49	36.475 5367	34.524 6834	31.052 0780	28.071 3695	25.501 6569
50	37.012 8757	34.999 6881	31.423 6050	28.362 3117	25.729 7640

TABLE IV

*Present value of an annuity of 1 per year for n periods*

$$a_n = \frac{1 - \frac{1}{(1+i)^n}}{i}$$

3½%	4%	4½%	5%	6%	n
0.966 1836	0.961 5385	0.956 9378	0.952 3810	0.943 3962	1
1.899 6943	1.886 0947	1.872 6678	1.859 4104	1.833 3927	2
2.801 6370	2.775 0910	2.748 9644	2.723 2480	2.673 0119	3
3.673 0792	3.629 8052	3.587 5257	3.545 9505	3.465 1056	4
4.515 0524	4.451 8223	4.389 9767	4.329 4767	4.212 3638	5
5.328 5530	5.242 1369	5.157 8725	5.075 6921	4.917 3243	6
6.114 5440	6.002 0547	5.892 7009	5.786 3734	5.582 3814	7
6.873 9555	6.732 7449	6.595 8861	6.463 2128	6.209 7938	8
7.607 6865	7.435 3316	7.268 7905	7.107 8217	6.801 6923	9
8.316 6053	8.110 8958	7.912 7181	7.721 7349	7.360 0870	10
9.001 5510	8.760 4767	8.528 9160	8.306 4142	7.886 8746	11
9.663 3343	9.385 0738	9.118 5808	8.863 2516	8.383 8439	12
10.302 7385	9.985 6478	9.682 8524	9.393 5730	8.852 6830	13
10.920 5203	10.563 1229	10.222 8253	9.898 6409	9.294 9839	14
11.517 4100	11.118 3874	10.739 5457	10.379 6580	9.712 2400	15
12.094 1168	11.652 2056	11.234 0150	10.837 7696	10.105 8953	16
12.651 3206	12.165 6689	11.707 1914	11.274 0662	10.477 2597	17
13.189 6817	12.659 2970	12.159 9918	11.689 5869	10.827 6035	18
13.709 8374	13.133 9304	12.593 2936	12.085 3209	11.158 1165	19
14.212 4033	13.590 3263	13.007 9365	12.462 2103	11.469 9212	20
14.697 9742	14.029 1599	13.404 7239	12.821 1527	11.764 0766	21
15.167 1248	14.451 1153	13.784 4248	13.163 0026	12.041 5817	22
15.620 4105	14.856 8417	14.147 7749	13.488 5739	12.303 3790	23
16.058 3676	15.246 9631	14.495 4784	13.798 6418	12.550 3575	24
16.481 5146	15.622 0799	14.828 2090	14.093 9446	12.783 3562	25
16.890 3523	15.982 7602	15.146 6114	14.375 1853	13.003 1662	26
17.285 3645	16.329 5857	15.451 3028	14.643 0336	13.210 5341	27
17.667 0188	16.663 0632	15.742 8735	14.898 1273	13.406 1643	28
18.035 7670	16.983 7146	16.021 8885	15.141 0736	13.590 7210	29
18.392 0454	17.292 0333	16.288 8885	15.372 4510	13.764 8312	30
18.736 2758	17.588 4036	16.544 3910	15.592 8105	13.929 0860	31
19.068 8655	17.873 5515	16.788 8009	15.802 6767	14.084 0434	32
19.390 2082	18.147 6457	17.022 8621	16.002 5492	14.230 2296	33
19.700 6842	18.411 1978	17.246 7580	16.192 9040	14.368 1411	34
20.000 6611	18.664 6132	17.461 0124	16.374 1943	14.498 2464	35
20.290 4938	18.908 2820	17.666 0406	16.546 8517	14.620 9871	36
20.570 5254	19.142 5788	17.862 2398	16.711 2873	14.736 7903	37
20.841 0874	19.367 8642	18.049 9902	16.867 8927	14.846 0192	38
21.102 4909	19.584 4848	18.220 6557	17.017 0407	14.949 0747	39
21.355 0723	19.792 7739	18.401 5844	17.159 0864	15.046 2969	40
21.599 1037	19.993 0518	18.566 1095	17.294 3680	15.138 0159	41
21.834 8828	20.185 6267	18.723 5498	17.423 2076	15.224 5433	42
22.062 6887	20.370 7049	18.874 2103	17.545 9120	15.306 1729	43
22.282 7910	20.548 8413	19.018 3831	17.662 7733	15.383 1820	44
22.495 4593	20.720 0307	19.156 3474	17.774 0698	15.455 8321	45
22.700 9181	20.884 6536	19.288 3707	17.880 0665	15.524 3699	46
22.899 4378	21.042 9361	19.414 7088	17.891 0157	15.589 0282	47
23.091 2443	21.195 1309	19.535 6065	18.077 1578	15.650 0266	48
23.276 5645	21.341 4720	19.651 2981	18.168 7217	15.707 5723	49
23.455 6179	21.482 1846	19.762 0078	18.255 9255	15.761 8606	50

TABLE V

*Sinking fund or annuity which, invested at the end of each period, will amount to 1 in n periods*

$$r = \frac{i}{(1+i)^n - 1}$$

n	2½%	3%	4%	5%	6%
1	1.000 0000	1.000 0000	1.000 0000	1.000 0000	1.000 0000
2	0.496 8944	0.496 2779	0.495 0495	0.493 8272	0.492 6108
3	0.329 2012	0.328 3830	0.326 7547	0.325 1372	0.323 5304
4	0.245 3610	0.244 4448	0.242 6237	0.240 8179	0.239 0270
5	0.195 0621	0.194 0893	0.192 1584	0.190 2469	0.188 3546
6	0.161 5338	0.160 5252	0.158 5258	0.156 5500	0.154 5975
7	0.137 5887	0.136 5562	0.134 5120	0.132 4054	0.130 5063
8	0.119 6331	0.118 5840	0.116 5098	0.114 4073	0.112 4564
9	0.105 6705	0.104 6098	0.102 5154	0.100 4560	0.098 4339
10	0.094 5031	0.093 4342	0.091 3265	0.089 2588	0.087 2305
11	0.085 3684	0.084 2938	0.082 1779	0.080 1060	0.078 0774
12	0.077 7583	0.076 6800	0.074 5506	0.072 4871	0.070 4621
13	0.071 3210	0.070 2404	0.068 1183	0.066 0483	0.064 0295
14	0.065 8051	0.064 7233	0.062 6020	0.060 5365	0.058 5263
15	0.061 0265	0.059 9444	0.057 8255	0.055 7665	0.053 7666
16	0.056 8467	0.055 7651	0.053 6501	0.051 5990	0.049 6108
17	0.053 1602	0.052 0797	0.049 9698	0.047 9278	0.045 9525
18	0.049 8848	0.048 8058	0.046 7021	0.044 6701	0.042 7087
19	0.046 9555	0.045 8785	0.043 7818	0.041 7606	0.039 8139
20	0.044 3204	0.043 2457	0.041 1567	0.039 1471	0.037 2157
21	0.041 9375	0.040 8655	0.038 7848	0.036 7873	0.034 8718
22	0.039 7724	0.038 7033	0.036 6314	0.034 6466	0.032 7474
23	0.037 7967	0.036 7307	0.034 6681	0.032 6664	0.030 8139
24	0.035 9866	0.034 9241	0.032 8711	0.030 9128	0.029 0474
25	0.034 3225	0.033 2634	0.031 2204	0.029 2759	0.027 4279
26	0.032 7873	0.031 7320	0.029 6992	0.027 7687	0.025 9383
27	0.031 3668	0.030 3153	0.028 2931	0.026 3769	0.024 5642
28	0.030 0486	0.029 0011	0.026 9897	0.025 0879	0.023 2932
29	0.028 8223	0.027 7788	0.025 7784	0.023 8913	0.022 1147
30	0.027 6785	0.026 6392	0.024 6490	0.022 7776	0.021 0193
31	0.026 6094	0.025 5743	0.023 5903	0.021 7390	0.019 9989
32	0.025 6079	0.024 5771	0.022 6106	0.020 7683	0.019 0466
33	0.024 6679	0.023 6414	0.021 6865	0.019 8594	0.018 1561
34	0.023 7839	0.022 7619	0.020 8187	0.019 0067	0.017 3220
35	0.022 9511	0.021 9336	0.020 0022	0.018 2056	0.016 5393
36	0.022 1653	0.021 1524	0.019 2328	0.017 4516	0.015 8038
37	0.021 4227	0.020 4144	0.018 5068	0.016 7409	0.015 1116
38	0.020 7198	0.019 7161	0.017 8206	0.016 0701	0.014 4593
39	0.020 0536	0.019 0546	0.017 1711	0.015 4361	0.013 8438
40	0.019 4214	0.018 4271	0.016 5557	0.014 8362	0.013 2624
41	0.018 8206	0.017 8311	0.015 9719	0.014 2679	0.012 7124
42	0.018 2491	0.017 2643	0.015 4173	0.013 7288	0.012 1917
43	0.017 7047	0.016 7246	0.014 8899	0.013 2169	0.011 6981
44	0.017 1856	0.016 2104	0.014 3879	0.012 7304	0.011 2298
45	0.016 6901	0.015 7198	0.013 9096	0.012 2675	0.010 7852
46	0.016 2167	0.015 2512	0.013 4534	0.011 8268	0.010 3625
47	0.015 7641	0.014 8034	0.013 0179	0.011 4067	0.009 9605
48	0.015 3307	0.014 3750	0.012 6018	0.011 0060	0.009 5778
49	0.014 9156	0.013 9648	0.012 2040	0.010 6235	0.009 2131
50	0.014 5176	0.013 5717	0.011 8232	0.010 2581	0.008 8655

TABLE V  
Sinking fund or annuity which, invested at the end of each period, will  
amount to 1 in  $n$  periods

$$r = \frac{i}{(1+i)^n - 1}$$

3½%	4%	4½%	5%	6%	n
1.000 0000	1.000 0000	1.000 0000	1.000 0000	1.000 0000	1
0.491 4005	0.490 1961	0.488 9976	0.487 8049	0.485 4369	2
0.321 9342	0.320 3485	0.318 7734	0.317 2086	0.314 1008	3
0.237 2511	0.235 4900	0.233 7436	0.232 0118	0.228 5915	4
0.186 4814	0.184 6271	0.182 7916	0.180 9748	0.177 3964	5
0.152 6682	0.150 7619	0.148 8784	0.147 0175	0.143 3626	6
0.128 5445	0.126 6006	0.124 7015	0.122 8198	0.119 1350	7
0.110 4766	0.108 5278	0.106 6006	0.104 7218	0.101 0359	8
0.096 4460	0.094 4930	0.092 5745	0.090 6901	0.087 0222	9
0.085 2414	0.083 2909	0.081 3788	0.079 5046	0.075 8680	10
0.076 0920	0.074 1409	0.072 2482	0.070 3889	0.066 7929	11
0.068 4839	0.066 5522	0.064 6662	0.062 8254	0.059 2770	12
0.062 0616	0.060 1437	0.058 2753	0.056 4558	0.052 9601	13
0.056 5707	0.054 6690	0.052 8203	0.051 0240	0.047 5849	14
0.051 8251	0.049 9411	0.048 1138	0.046 3423	0.042 9628	15
0.047 6848	0.045 8200	0.044 0154	0.042 2699	0.038 9521	16
0.044 0431	0.042 1985	0.040 4176	0.038 6991	0.035 4448	17
0.040 8168	0.038 9933	0.037 2369	0.035 5462	0.032 3565	18
0.037 9403	0.036 1386	0.034 4073	0.032 7450	0.029 6209	19
0.035 3611	0.033 5817	0.031 8761	0.030 2426	0.027 1846	20
0.033 0366	0.031 2801	0.029 6006	0.027 9961	0.025 0045	21
0.030 9321	0.029 1988	0.027 5456	0.025 9705	0.023 0456	22
0.029 0188	0.027 3091	0.025 6825	0.024 1368	0.021 2785	23
0.027 2728	0.025 5868	0.023 9870	0.022 4709	0.019 6790	24
0.025 6740	0.024 0120	0.022 4390	0.020 9525	0.018 2267	25
0.024 2054	0.022 5674	0.021 0214	0.019 5643	0.016 9043	26
0.022 8524	0.021 2385	0.019 7195	0.018 2919	0.015 6972	27
0.021 6026	0.020 0130	0.018 5208	0.017 1225	0.014 5925	28
0.020 4454	0.018 8799	0.017 4146	0.016 0455	0.013 5796	29
0.019 3713	0.017 8301	0.016 3915	0.015 0514	0.012 6489	30
0.018 3724	0.016 8553	0.015 4434	0.014 1321	0.011 7922	31
0.017 4415	0.015 9486	0.014 5632	0.013 2804	0.011 0023	32
0.016 5724	0.015 1036	0.013 7445	0.012 4900	0.010 2729	33
0.015 7597	0.014 3148	0.012 9819	0.011 7554	0.009 5984	34
0.014 9983	0.013 5773	0.012 2704	0.011 0717	0.008 9739	35
0.014 2842	0.012 8869	0.011 6058	0.010 4345	0.008 3948	36
0.013 6132	0.012 2396	0.010 9840	0.009 8398	0.007 8574	37
0.012 9821	0.011 6310	0.010 4017	0.009 2842	0.007 3581	38
0.012 3877	0.011 0608	0.009 8557	0.008 7646	0.006 8938	39
0.011 8273	0.010 5235	0.009 3431	0.008 2782	0.006 4615	40
0.011 2982	0.010 0174	0.008 8616	0.007 8223	0.006 0589	41
0.010 7983	0.009 5402	0.008 4087	0.007 3947	0.005 6834	42
0.010 3254	0.009 0899	0.007 9823	0.006 9933	0.005 3331	43
0.009 8777	0.008 6645	0.007 5807	0.006 6162	0.005 0061	44
0.009 4534	0.008 2625	0.007 2020	0.006 2617	0.004 7005	45
0.009 0511	0.007 8820	0.006 8447	0.005 9282	0.004 4148	46
0.008 6692	0.007 5219	0.006 5073	0.005 6142	0.004 1477	47
0.008 3065	0.007 1806	0.006 1886	0.005 3184	0.003 8977	48
0.007 9617	0.006 8571	0.005 8872	0.005 0396	0.003 6636	49
0.007 6337	0.006 5502	0.005 6021	0.004 7767	0.003 4443	50

## C

## RAILWAY STATEMENTS

## INCOME STATEMENT

## Of the X Railroad Company

For the year ended December 31st, 1915

## Operating Income:

Railway Operating Revenues	Freight . . . . .	\$140,654,856	
	Passenger . . . . .	38,611,085	
	Mail . . . . .	3,372,458	
	Express . . . . .	4,204,727	
	All other transportation . .	3,806,402	
	Incidental . . . . .	6,203,637	
	Joint facility — Credit . .	8,998	
	Joint facility — <i>Debit</i> . .	<u>233,996</u>	
	Total . . . . .		\$196,628,167

Railway Operating Expenses	Maintenance of way and structures . . . . .	\$25,328,512	
	Maintenance of equipment . .	38,641,078	
	Traffic . . . . .	2,386,064	
	Transportation . . . . .	68,650,005	
	Miscellaneous . . . . .	2,653,146	
	General . . . . .	<u>5,077,754</u>	
	Total . . . . .		<u>142,736,559</u>

Net Revenue from Railway Operations	\$53,891,608
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Railway Tax Accruals . . . . .	\$7,594,403
Uncollectible Railway Revenues . . .	<u>46,280</u>

7,640,683

Railway Operating Income . . . . .	\$46,250,925
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Revenues from Miscellaneous Operations	\$342,650
Expenses of Miscellaneous Operations . .	<u>216,420</u>

Net Revenue from Miscellaneous Operations	<u>126,230</u>
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Total Operating Income . . . . .	\$46,377,155
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Non-Operat- ing Income	Joint facility rent income . . . . .	\$ 1,511,004	
	Income from lease of road . . . . .	173,786	
	Miscellaneous rent income . . . . .	829,881	
	Miscellaneous non-operating physical property . . . . .	75,395	
	Dividend income . . . . .	13,334,499	
	Income from funded securities . . . . .	790,395	
	Income from unfunded se- curities and accounts . . . . .	2,255,459	
	Income from sinking and other reserve funds . . . . .	1,307,888	
	Release of premiums on funded debt . . . . .	3,936	
	Miscellaneous income . . . . .	<u>93,072</u>	
	Total non-operating income . . . . .		<u>20,375,315</u>
	Gross Income . . . . .		<u>\$66,752,470</u>

Deductions from Gross Income	Hire of equipment — debit balance . . . . .	\$ 1,325,955	
	Joint facility rents . . . . .	1,084,556	
	Rent for leased roads . . . . .	8,574,859	
	Miscellaneous rents . . . . .	711,049	
	Miscellaneous tax accruals . . . . .	41,943	
	Separately operated proper- ties — loss . . . . .	33,717	
	Interest on funded debt . . . . .	11,834,384	
	Interest on unfunded debt . . . . .	287,906	
	Amortization of discount on funded debt . . . . .	35,400	
	Miscellaneous income charges . . . . .	<u>306,549</u>	
	Total deductions from gross income . . . . .		<u>24,236,318</u>
Net Income . . . . .			<u>\$42,516,152</u>

## Disposition of Net Income:

Income applied to sinking fund and other reserve funds . . . . .	\$ 1,946,341
Dividend appropriations of income . . . . .	29,552,219
Income appropriated for investment in physical property:	
Expended for revision of grades, align- ment, and tracks, elimination of grade crossings, betterment of equipment, water supply, etc. . . . .	7,286,849



Construction expenditures on leased and branch roads directly operated, borne by the X Railroad Company . . . .	\$3,239,912	
Stock discount extinguished through income . . . .	<u>200,000</u>	
		<u>42,225,321</u>
Balance transferred to credit of Profit and Loss . . . . .		\$290,831

## PROFIT AND LOSS STATEMENT

Amount to credit of Profit and Loss December 31, 1914 . . . . .			\$31,751,125
Credit balance transferred from income . . . .		290,831	
Profit on road and equipment sold . . . .		8,600	
Delayed income credits . . . . .		12,200	
Unrefundable overcharges . . . . .		650	
Donations . . . . .		<u>26,500</u>	
			\$32,080,906
Deduct :			
Surplus applied to sinking and other reserve funds . . . . .	\$1,522,000		
Dividend appropriations of surplus . . . .	626,000		
Debt discount extinguished through surplus . .	484,680		
Miscellaneous appropriations of surplus . .	142,000		
Loss on retired road and equipment . . . .	716,450		
Delayed income debits . . . . .	<u>37,798</u>		
			<u>3,528,028</u>
Balance to credit of Profit and Loss December 31st, 1915			\$28,560,978

## GENERAL BALANCE SHEET OF THE X RAILROAD COMPANY

December 31, 1915

*Assets*

Investments :			
Investment in Road and Equipment :			
Road . . . . .	\$306,815,457		
Equipment . . . . .	188,072,503		
General expenditures . . . . .	<u>68,152</u>		
			\$495,856,202
Improvement on Leased Railway Property since June 30th, 1907 :			
Leased lines road . . . . .	\$18,125,575		
Leased lines equipment . . . . .	160,670		
Leased lines general expenditures . . . .	<u>1,288</u>		
			18,287,533

# APPENDIX C

671

Sinking funds . . . . .	\$3,469,022	
Less X R.R. Co. obligations . . . . .	<u>1,391,100</u>	2,077,922
Miscellaneous physical property . . . . .		2,132,020
Investments in affiliated companies:		
Stocks . . . . .	\$164,784,523	
Bonds . . . . .	31,712,865	
Notes . . . . .	75,522,918	
Advances . . . . .	<u>12,611,467</u>	284,631,773
Other investments:		
Stocks . . . . .	\$65,412,599	
Bonds . . . . .	538,946	
Notes . . . . .	15,745	
Miscellaneous . . . . .	<u>12</u>	65,967,302
Current Assets:		
Cash . . . . .	\$13,778,292	
Time drafts and deposits . . . . .	28,004,263	
Special deposits . . . . .	336,916	
Loans and bills receivable . . . . .	50,406	
Traffic and car-service balances receivable . . . . .	16,732,166	
Net balance receivable from agents and conductors . . . . .	6,490,728	
Miscellaneous accounts receivable . . . . .	9,122,087	
Material and supplies . . . . .	16,989,418	
Interest and dividends receivable . . . . .	1,695,642	
Rents receivable . . . . .	<u>56,081</u>	
Deferred Assets:		93,255,999
Working fund advances . . . . .	\$ 193,291	
Insurance and other funds . . . . .	\$34,291,172	
Less X R.R. Co. obligations . . . . .	<u>4,028,500</u>	
	30,262,672	
Other deferred assets . . . . .	<u>34,345</u>	30,490,308
Unadjusted Debits:		
Rents and insurance premiums paid in advance . . . . .	\$ 78,163	
Discount on capital stock . . . . .	8,217,600	
Discount on funded debt . . . . .	1,113,267	
Property abandoned chargeable to operat- ing expenses . . . . .	139,846	
Other unadjusted debits . . . . .	<u>2,241,464</u>	
Securities issued or assumed held in treasury . . . . .	\$62,250	11,700,340
Total . . . . .		\$1,004,489,399

*Liabilities*

Stock:		
Capital stock . . . . .	\$509,265,700	
Less — Held by X. R.R. Co. . . . .	\$32,350	
Held for acquisition of stock of acquired and affil- iated companies . . . . .	29,650	
	<u>62,000</u>	\$509,203,700
Premium realized on capital Stock from January 1st, 1909 . . . . .		5,717,647
Governmental Grants:		
Grants in aid of construction . . . . .		516,000
Mortgage, Bonded and Secured Debt:		
Funded Debt of the X R.R. Co.		
Consolidated mortgage dollar bonds, 5%, due September 1st, 1919 . . . . .	\$ 4,998,000	
Consolidated mortgage dollar bonds, 4%, due May 1st, 1943 . . . . .	2,561,000	
Consolidated mortgage sterling bonds, 3½%, due July 1st, 1945 . . . . .	3,326,130	
Consolidated mortgage sterling bonds, 4%, due May 1st, 1948 . . . . .	19,400,000	
Ten-year convertible gold bonds, 4%, due May 1st, 1920 . . . . .	\$20,000,000	
Less — Held in sinking or other funds . . . . .	<u>6,000</u>	19,994,000
Consolidated mortgage gold bonds, 4½%, due August 1st, 1960 . . . . .		49,000,000
General mortgage gold bonds, 4½%, Series “A,” due June 1, 1965 . . . . .	\$65,000,000	
Less — Held in sinking or other funds . . . . .	<u>625,000</u>	64,375,000
Real estate purchase money bonds, 4%, due May 1st, 1923 . . . . .	<u>2,000,000</u>	
		165,654,130
Funded Debt of Acquired Companies		
Assumed by the X R.R. Co.		
Orchard Valley Ry. Co. general mtg. 4% gold bonds, due March 1st, 1942 . . . . .	\$20,000,000	
Less — Held in sinking or other funds . . . . .	<u>870,000</u>	\$ 19,130,000
Cambwin and Clearfield Ry. Co., general mortgage 4% coupon registered		

bonds, due February 1st, 1955			
	\$2,000,000		
Less — Held in sinking or other			
funds . . . . .	<u>1,460,000</u>	540,000	
Washington and Jefferson Ry. Co., first			
mortgage, 6% bonds, due Jan. 1st,			
1927 . . . . .		2,073,000	
Junction R.R. Co. general mortgage, 3½%			
bonds, due April 1st, 1930	\$725,000		
Less — Held by X R.R.			
Co. . . . .	<u>143,000</u>	582,000	
Urban and North Western R.R. Co. gen.			
mtg. 5% bonds, due Jan. 1st,			
1930 . . . . .		1,021,000	
Lawrence and Erie R.R. Co. general mortgage			
6% bonds, due July 1st, 1920			
. . . . .	\$8,680,000		
Less — Held in sinking or			
other funds . . . . .	<u>500,000</u>	8,180,000	
Pittsburgh and Charleston Ry. Co., first			
mtg. 4% bonds, due Nov. 1, 1943 .		18,005,000	
Sunbury and Wabash Ry. Co., second mtg.			
6% bonds, due May 1st, 1938 . .		1,349,500	
Western Ry. Co. consolidated mtg. 4%			
bonds, due June 1st, 1928 . . . .	<u>5,536,600</u>	56,417,100	
Guaranteed Stock Trust Certificates:			
Harrisville R.R. 4% stock trust ctfs., due			
July 1st, 1921 . . . . .		\$6,770,000	
New York and Vineyard R.R. 4% stock			
trust ctfs., due June 1st, 1948			
. . . . .	\$7,478,250		
Less — Held by X			
R.R. Co. \$ 250			
Held in			
sinking			
fund or			
other funds <u>200,000</u>	<u>200,250</u>	<u>7,278,000</u>	14,048,000
Equipment trust obligations	\$17,743,016		
Less — Held in sinking or			
other funds . . . . .	<u>160,000</u>		17,583,016
Mortgages and ground-rents			
payable	\$3,196,359		
Less — Held in sinking or			
other funds . . . . .	<u>883,200</u>		2,313,159

## Current Liabilities:

Loans and bills payable . . . . .	\$ 3,000,000
Traffic and car-service balances payable . .	14,380,033
Audited accounts and wages payable . . .	18,561,804
Miscellaneous accounts payable . . . . .	8,678,051
Interest matured unpaid . . . . .	807,955
Dividends matured unpaid . . . . .	58,565
Funded debt matured unpaid . . . . .	1,609,440
Unmatured interest accrued . . . . .	2,116,066
Unmatured rents accrued . . . . .	<u>267,371</u>

49,488,285

## Deferred Liabilities . . . . .

224,377

## Unadjusted Credits:

Tax liability . . . . .	\$ 6,266,370
Premium on funded debt . . . . .	191,446
Operating reserves . . . . .	1,866,496
Accrued depreciation — road . . . . .	7,592
Accrued depreciation — equipment . . . .	20,036,904
Other unadjusted credits . . . . .	<u>3,142,085</u>

31,510,893

## Corporate Surplus:

Additions to property through income and surplus since June 30th, 1907 . . . . .	\$83,631,500
Funded debt retired through income and surplus . . . . .	1,372,832
Sinking fund reserves . . . . .	3,467,049
Miscellaneous fund reserves . . . . .	34,593,720
Appropriated surplus not specifically invested . . . . .	<u>187,013</u>

123,252,114

Total appropriated surplus . . . . .

28,560,078

Profit and Loss — Balance . . . . .

Total . . . . .

\$1,004,489,399

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